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FRIDAY, JANUARY 22, 1999 MORNING SESSION

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THE COURT: WE'RE BACK ON THE RECORD. THE RECORD SHOULD REFLECT THAT WE HAVE COMPLETED THE READING.

WHAT IS OUR NEXT ORDER OF BUSINESS?

MS. CHABER: AT THIS TIME, YOUR HONOR, THE PLAINTIFF WOULD CALL TO THE STAND DR. ALLAN SMITH.

THE COURT: ARE WE GOING TO BE USING THE SCREEN?

MS. CHABER: NO.

THE COURT: IF NOT, COULD WE JUST TAKE IT DOWN.

TESTIMONY OF

ALLAN SMITH, M.D.,

A WITNESS CALLED ON BEHALF OF THE PLAINTIFF, HAVING BEEN DULY SWORN, TESTIFIED AS FOLLOWS: WITNESS SWORN.

THE CLERK: PLEASE STATE YOUR NAME.

THE WITNESS: ALLAN SMITH.

THE CLERK: PLEASE SPELL YOUR LAST NAME.

THE WITNESS: S-M-I-T-H.

THE CLERK: IS ALLAN WITH TWO L'S?

THE WITNESS: YES, A-L-L-A-N.

THE CLERK: THANK YOU. PLEASE TAKE THE STAND.

DIRECT EXAMINATION

BY MS. CHABER: Q. DR. SMITH, COULD YOU TELL THE JURY WHAT YOU DO.

A. I'M A PROFESSOR OF EPIDEMIOLOGY AT THE UNIVERSITY OF CALIFORNIA BERKELEY.

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Q. AND ARE YOU A MEDICAL DOCTOR AS WELL?

A. YES.

Q. ARE YOU LICENSED TO PRACTICE IN CALIFORNIA?

A. NO, I DON'T TREAT PATIENTS. I DO RESEARCH AND TEACHING, SO I DON'T HAVE A LICENSE ANY LONGER TO PRACTICE MEDICINE ANYWHERE IN THE WORLD.

Q. CAN YOU TELL US WHAT A PROFESSOR OF EPIDEMIOLOGY DOES.

A. WELL, PART OF MY WORK IS TEACHING, TEACHING GRADUATE STUDENTS AT THE UNIVERSITY OF CALIFORNIA. PART IS DOING RESEARCH, INVESTIGATIONS WHERE, IN EPIDEMIOLOGICAL RESEARCH, WE TRY TO WORK OUT THE CAUSES OF DISEASES IN HUMANS AND HOW TO PREVENT DISEASES OCCURRING.

Q. CAN YOU GIVE US A BIT OF YOUR BACKGROUND IN TERMS OF YOUR EDUCATIONAL HISTORY.

A. YES. I WAS BORN IN NEW ZEALAND AND MY EDUCATION WAS IN NEW ZEALAND. I FIRST STUDIED MATHEMATICS AND CHEMISTRY. THEN I WENT TO MEDICAL SCHOOL AND COMPLETED THAT, WORKED IN A HOSPITAL FOR ONE YEAR, AND THEN DECIDED I WANTED TO GO FULL TIME INTO EPIDEMIOLOGY.

SO I THEN TRAINED IN EPIDEMIOLOGY AND COMPLETED A PH.D. ALSO IN NEW ZEALAND. I COMPLETED THAT IN 1975.

Q. AND CAN YOU GIVE US A BRIEF HISTORY OF YOUR WORK EXPERIENCES THAT CORRESPOND TO GET US TO WHERE WE ARE TODAY.

A. YES. I WAS THEN AWARDED A RESEARCH SCHOLARSHIP THAT TOOK ME TO THE UNIVERSITY OF NORTH CAROLINA IN CHAPEL HILL. AND THEN, AFTER A YEAR, I WAS APPOINTED TO THE

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FACULTY THERE AS AN ASSISTANT PROFESSOR, AND TAUGHT IN THE SCHOOL OF PUBLIC HEALTH OF THE UNIVERSITY OF NORTH CAROLINA

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IN CHAPEL HILL.
AND THEN I RETURNED TO NEW ZEALAND AND TAUGHT IN A MEDICAL SCHOOL FOR FIVE YEARS, UP UNTIL 1983. AND THAT'S WHEN I CAME TO BERKELEY, 15 YEARS AGO.
Q. NOW, YOU INDICATED THAT SOME OF WHAT YOU DO IS TEACHING AND SOME OF WHAT YOU DO IS RESEARCH?
A. YES. THEY ARE INTERMINGLED, OF COURSE, AND PART OF MY TEACHING RELATES TO RESEARCH AND SOME OF MY STUDENTS, OF COURSE, ARE RESEARCH STUDENTS. SO THERE'S OVERLAP THERE.
Q. AND OVER THE YEARS, WHAT HAVE BEEN AREAS THAT YOU HAVE BEEN INVOLVED IN IN YOUR RESEARCH?
A. IT HAS ENDED UP FOCUSING OVER MOST OF MY CAREER ON THE EFFECTS OF VARIOUS CHEMICAL SUBSTANCES IN CAUSING HUMAN DISEASE, MAINLY CANCER, BUT NOT ONLY.
I'VE ALSO DONE STUDIES THAT RELATE TO OTHER EFFECTS OF, FOR EXAMPLE, ON REPRODUCTION, ON RESPIRATORY DISEASE.
BUT MOST OF MY RESEARCH HAS FOCUSED ON CAUSES OF CANCERS AND, AGAIN, HOW TO PREVENT THEM FROM OCCURRING.
Q. NOW, HOW DOES EPIDEMIOLOGY -- BEFORE I GO ON TO THAT, HAVE YOU PUBLISHED IN THE FIELD?
A. YES.
Q. HAVE YOU LECTURED AND GIVEN PRESENTATIONS IN THE FIELD?
A. YES.
Q. AND ARE YOU PART OF ANY CANCER GROUPS OR PANELS

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OR INVESTIGATIONS?
A. AT VARIOUS TIMES -- THAT'S RATHER -- THAT COVERS QUITE A LOT -- I HAVE BEEN ON VARIOUS GOVERNMENT PANELS. I DO MAJOR PROJECTS FOR THE CALIFORNIA EPA.
Q. THAT'S THE ENVIRONMENTAL PROTECTION AGENCY?
A. RIGHT. IT USED TO BE THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES, BUT THAT PART, THEY CHANGED THE NAME TO THE CALIFORNIA EPA.
I DO NATIONAL THINGS THAT RELATE TO THE NATIONAL CANCER INSTITUTE, THE NATIONAL ACADEMY OF SCIENCES.
AND THEN, IN THE INTERNATIONAL AREA, I'VE DONE WORK THAT RELATES TO THE WORLD HEALTH ORGANIZATION AND THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER. BUT THOSE ARE WHERE I'M AN ADVISER ON A COMMITTEE.
BUT A LOT OF WHAT I DO IS ACTUAL RESEARCH, INVESTIGATIONS.
Q. OKAY. AND ARE YOU ACTIVELY INVOLVED AT THIS TIME IN RESEARCH?
A. YES, I AM.
Q. AND CAN YOU DESCRIBE SOME OF THAT FOR US.
A. THE PROJECTS INCLUDE AN AREA OF ASSESSING CHEMICAL RISKS IN CAUSING CANCER. AND IN THAT, I CURRENTLY HAVE WORK THAT RELATES TO DIESEL EXHAUST AS A CAUSE OF LUNG CANCER, TO SILICA, INHALATION AND SILICOSIS, DISEASE OF THE LUNGS AND ITS RELATIONSHIP TO LUNG CANCER.
I HAVE A PROJECT THAT RELATES TO DIOXIN LEVELS IN HUMANS AND THE RELATIONSHIP TO VARIOUS CANCER RISKS.
BUT THE MAIN PART OF MY CURRENT RESEARCH CONCERNS

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ARSENIC LEVELS IN DRINKING WATER IN DIFFERENT PARTS OF THE WORLD. AND IN THAT, I HAVE CURRENTLY A MAJOR STUDY I DIRECT IN CHILE, ONE IN ARGENTINA, ANOTHER ONE THAT'S IN NEVADA AND CALIFORNIA, AND ANOTHER ONE THAT'S IN INDIA. AND I'M ALSO DEVELOPING A PROJECT IN BANGLADESH.

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Q. COULD YOU JUST GIVE US A BRIEF VERSION OF HOW YOU GO ABOUT DOING ONE OF THESE STUDIES.

A. WELL, FIRST OF ALL, YOU START WITH A CONCEPT OR A HYPOTHESIS. AND IN THE CASE OF ARSENIC PROJECTS, ONE AREA WAS, FOR EXAMPLE, DID ARSENIC INGESTION CAUSE BLADDER CANCER?

AND THEN WE GO ABOUT WORKING OUT HOW TO GET FUNDING TO DO CERTAIN RESEARCH. AND PART OF THAT, WE HAVE TO FIND PEOPLE WHO ARE HIGHLY EXPOSED. SO THERE IS QUITE A LONG PERIOD THERE WHERE WE'RE DESIGNING STUDIES, FINDING POPULATIONS WHO ARE EXPOSED IN THE WORLD AT HIGH LEVELS, RAISING FUNDS.

AND THEN WE ACTUALLY START THE STUDIES. AND THEY CAN BE OF SEVERAL TYPES. IN SOME STUDIES, WE START WITH PATIENTS WHO ALREADY HAVE CANCER, AND IN THAT INSTANCE, WE, IN ARGENTINA, FOR EXAMPLE, WENT TO AN AREA WHERE 34 AREAS HAD HIGH ARSENIC IN THE WATER AND STARTED IDENTIFYING THE BLADDER CANCER PATIENTS.

AND FOR EACH ONE, WE GOT THE BLADDER TUMOR BIOPSY FROM OUR PATHOLOGIST WORKING ON THE PROJECT. EACH PATIENT WAS INTERVIEWED IN DETAIL ABOUT ALL THE HOMES LIVED IN, WHERE THEY GOT THE WATER.

AND THEN I HAVE ANOTHER GROUP WHO GETS WATER

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SAMPLES FROM THE WATER, PREVIOUS WELLS THEY DRANK FROM, RIGHT THROUGH THE LAST 30 TO 40 YEARS.

AND WE ALSO GETS CELLS FROM THE MOUTH TO LOOK AT GENES THAT MIGHT RELATE TO SUSCEPTIBILITY. THERE IS A LOT OF DETAILS. I DON'T WANT TO GO ON AT GREAT LENGTH. THEY ARE QUITE COMPLICATED STUDIES.

BUT THE INTENT OF THEM IN THAT INSTANCE IS: DOES ARSENIC CAUSE BLADDER CANCER? IF IT DOES, AT WHAT LEVELS? WHAT'S THE DOSE? WHAT MIGHT MAKE SOME PEOPLE MORE SUSCEPTIBLE THAN OTHERS?

AND ULTIMATELY, THEY ARE FUNDED BECAUSE THEY RELATE TO THINGS LIKE DRINKING WATER STANDARDS, WHAT LEVEL SHOULD WE ALLOW TO HAVE ARSENIC IN DRINKING WATER.

Q. HAVE YOU DONE WORK ON ASBESTOS?

A. YES. I HAVE NOT AN EXTENSIVE FOCUS OF RESEARCH, BUT I HAVE DONE STUDIES AND HAVE PUBLICATIONS THAT RELATE TO ASBESTOS, INCLUDING THE WAY ASBESTOS AND SMOKING MAY ACT JOINTLY IN CAUSING LUNG CANCER, THE EVIDENCE THAT DIFFERENT TYPES OF ASBESTOS MIGHT CAUSE A CANCER OF THE LINING OF THE LUNG. THOSE ARE A COUPLE OF AREAS.

Q. WE JUST WERE READING A DEPOSITION AND THE WORD "SYNERGISTICALLY" CAME UP IN RELATION TWO COMPOUNDS.

CAN YOU COMPLAIN WHAT "SYNERGISTICALLY" MEANS?

A. YES. IT'S WHEN TWO AGENTS, LIKE TWO CHEMICALS, ACT JOINTLY IN CAUSING CANCER IN A WAY THAT THEY ARE ENHANCING EACH OTHER'S IMPACT. SO THAT THOSE PEOPLE WHO HAVE BOTH EXPOSURES ARE MUCH WORSE OFF THAN YOU'D EXPECT, JUST AS ADDING THE RISKS.

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AND IN ONE OF OUR CURRENT PROJECTS, FOR EXAMPLE, THERE'S ONE ON LUNG CANCER WHERE WE'RE LOOKING AT THE SYNERGY BETWEEN ARSENIC AND CIGARETTE SMOKING IN CAUSING LUNG CANCER.

WHAT WE'RE LOOKING FOR IS WHETHER OR NOT, IF YOU CONSIDER THE RISKS FROM ARSENIC AND THEN SEPARATELY CONSIDER THE RISKS FROM SMOKING, WHETHER THE SMOKERS WHO HAVE HIGH LEVELS OF ARSENIC IN THE LUNG HAVE RISKS WAY BEYOND WHAT

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YOU'D EXPECT, JUST GIVEN THE SEPARATE EFFECTS THAT INDEED WE'RE FINDING.

WE HAVE ALREADY PUBLISHED ONE PIECE OF EVIDENCE ON THAT, AND CURRENT STUDIES ARE SHOWING THAT AS WELL.

Q. HOW DOES EPIDEMIOLOGY DETERMINE THE CAUSE OF HUMAN CANCER?

A. WELL, OBVIOUSLY, IT'S BASED ON SCIENTIFIC STUDIES. AND THEN WE HAVE A SERIES OF CRITERIA THAT WE USE TO ASSESS THE HUMAN EVIDENCE THAT WE WORK THROUGH.

AND I DON'T KNOW IF IT WOULD HELP JUST TO LIST THEM UP THERE.

Q. WHAT'S THE CRITERIA?

A. THESE ARE WHAT WE CALL CRITERIA FOR CAUSAL INFERENCE (WRITING ON BOARD).

AND WE AS EPIDEMIOLOGISTS TEND TO LIST THEM SLIGHTLY DIFFERENTLY, BUT THEY ALL RELATE TO CERTAIN FUNDAMENTAL CONCEPTS. AND I'LL JUST LIST THEM THE WAY I USUALLY DO IT IN TEACHING.

THE FIRST ONE IS, WE CONSIDER WHETHER OR NOT STUDIES MIGHT JUST BE PRODUCING CHANCE FINDINGS.

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Q. WHAT DOES THAT MEAN?

A. WE KNOW THAT NUMBERS FLUCTUATE. SOMETIMES WE'LL FIND A LITTLE HIGHER RATE THAN ANOTHER, JUST THE RANDOM PLAY OF NUMBERS. SO WE LOOK AT THAT AND EXAMINE IT AND WANT TO DISMISS IT, JUST THE EXPLANATION OF WHAT WE'RE FINDING.

Q. WHAT'S THE NEXT ONE?

A. THE SECOND ONE IS WHETHER OR NOT BIAS IS OCCURRING.

Q. WHAT IS "BIAS"?

MR. BARRON: MAY I JUST INTERRUPT FOR A SECOND. IS THIS CUMULATIVE TO WHAT WE HAVE ALREADY HAD?

THE COURT: SOME OF IT IS. I DON'T WANT TO GO OVER MATERIAL THAT WE HAVE ALREADY GONE OVER, SO LET ME JUST CAUTION YOU, LET'S NOT DO THAT. SOME OF THESE THINGS WE'VE ALREADY COVERED. I DON'T WANT TO GO OVER THEM TWICE.

LET ME LEAVE IT TO YOUR JUDGMENT TO AVOID DOING THAT. AND IF THE DEFENDANT'S COUNSEL THINKS THAT IS WHAT'S HAPPENING, YOU MAKE YOUR OBJECTION. MY RULING IS GOING TO BE THAT WE DON'T GO OVER THINGS TWICE.

MS. CHABER: RIGHT.

AT THIS POINT, YOUR HONOR, WE'RE GOING TO JUST DO THIS AS BACKGROUND FOR THE NEXT THING.

THE COURT: I'M NOT GOING INTO BACKGROUND TWICE. IF WE HAVE HAD THESE CONCEPTS EXPLAINED TO THE JURY ONCE, WE'RE NOT GOING TO DO IT A SECOND TIME. SO IF YOU ASK THE QUESTION, YOU ARE REPRESENTING TO US THAT WE HAVEN'T HAD IT BEFORE, BECAUSE OTHERWISE, I'M GOING TO SUSTAIN THE OBJECTION. I DON'T WANT TO GO OVER MATERIAL TWICE.

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MS. CHABER: ALL RIGHT.

THE COURT: I'M SURE THE JURY RECALLS WHAT THEY HEARD.

MS. CHABER: Q. WHAT DO YOU MEAN BY "BIAS"?

A. I MEAN THAT, SINCE WE CAN'T DO EXPERIMENTS ON PEOPLE, WE DO STUDIES OF WHAT WE REFER TO AS FREE-LIVING PEOPLE, THAT PEOPLE MAY DIFFER. AND SINCE THEY DIFFER, YOU MIGHT GET FINDINGS OF INCREASED RISK THAT DON'T RELATE TO THE CAUSE YOU'RE LOOKING AT. IT'S SOMETHING ELSE.

THAT'S ONE TYPE OF BIAS. WE CAN LIST ABOUT 100 IN THE EPIDEMIOLOGY. THAT'S ONE TYPE OF CONFOUNDING.

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ANOTHER TYPE IS MISCLASSIFICATION BIAS, WHERE THERE'S ERRORS IN DIAGNOSIS OR ERRORS IN EXPOSURE. AND WE CONSIDER WHETHER OR NOT THIS FINDING THAT WE COME UP WITH IN OUR STUDIES MIGHT JUST BE A CONSEQUENCE OF SOME TYPE OF BIAS.

Q. OKAY. AND WHAT ELSE DO YOU CONSIDER?

A. THE THIRD ONE IS CONSISTENCY. IN EPIDEMIOLOGIC STUDIES, WE LIKE TO SEE FINDINGS BY DIFFERENT SCIENTISTS IN DIFFERENT POPULATIONS AND FINDINGS NOT EXACTLY THE SAME, BUT GENERALLY A PATTERN THAT SUPPORTS CAUSE OCCURRING.

Q. OKAY. WHAT'S NEXT?

A. THEN WE LOOK AT STRENGTH OF ASSOCIATION.

Q. MEANING?

A. HERE, WE'RE REFERRING TO HOW BIG ARE THE RISKS IN A GROUP? HOW STRONG IS THE FINDING? IF THE POPULATION HAS A TENFOLD RISK OF A DISEASE, FOR EXAMPLE, IT'S VERY STRONG AND SPEAKS STRONGLY FOR A CAUSAL ASSOCIATION.

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NONE OF THESE ON THEIR OWN PROVE IT, BUT IF THE ASSOCIATION IS RATHER SMALLER, LET'S SAY 50 PERCENT INCREASE IN RISK OR RELATIVE RISK, 1.5, THAT IS HARDER TO PROVE CAUSATION.

MR. BARRON: AGAIN, YOUR HONOR, I DO HAVE TO NOTE, I BELIEVE WE HAVE GONE OVER THIS AT SOME LENGTH.

THE COURT: I DO TOO. I DO TOO.

I'M GOING TO TELL YOU ONE MORE TIME, MS. CHABER, LET'S NOT GO OVER MATERIAL. PLEASE RESPECT THE COURT'S RULING.

MS. CHABER: YES, YOUR HONOR.

Q. WITH RESPECT TO MS. HENLEY, DID YOU REVIEW MATERIALS WITH RESPECT TO WHETHER OR NOT THE CRITERIA FOR CAUSAL INFERENCE HAS BEEN MET IN MS. HENLEY'S CASE?

MR. BARRON: OBJECTION, YOUR HONOR. THE LACK OF FOUNDATION. IMPROPER OPINION AT THIS STAGE.

THE COURT: SUSTAINED.

MR. BARRON: AND ALSO, VAGUE AND AMBIGUOUS.

THE COURT: SUSTAINED.

MS. CHABER: Q. DR. SMITH, DO YOU DO ANALYSIS OF EPIDEMIOLOGY ONLY AS TO GROUPS OF PEOPLE OR CAN IT BE APPLIED TO INDIVIDUALS?

A. THE INTENT OF EPIDEMIOLOGY IS TO STUDY GROUPS SO THAT WE CAN REACH VALID SCIENTIFIC INFERENCE THAT THEN CAN BE APPLIED TO DECISION-MAKING, BOTH ABOUT GROUPS AND ABOUT INDIVIDUALS.

Q. AND HAVE YOU DONE AN ANALYSIS OF THAT TYPE WITH RESPECT TO MS. HENLEY?

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A. YES.

Q. AND CAN YOU TELL US, FIRST OF ALL, WHAT DID YOU DO TO PREPARE FOR THAT ANALYSIS?

A. WELL, I READ SOME OF THE MATERIAL BRIEFLY. I WAS SENT A VARIETY OF DEPOSITIONS. I READ THEM.

AND THEN I PONDERED FOR A LONG TIME THAT SINCE THE EVIDENCE TO ME WAS SO UTTERLY CLEAR, HOW TO EXPLAIN TO THE JURY THAT THE EVIDENCE ON CAUSATION, IT WAS SO UTTERLY CLEAR FROM A SCIENTIFIC STANDPOINT.

Q. LET ME --

MR. BARRON: YOUR HONOR, EXCUSE ME. I'M GOING TO MOVE TO STRIKE THE LAST PART OF THE ANSWER AS NONRESPONSIVE. I THINK IT'S WITHOUT FOUNDATION OF WHAT HE DID.

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THE COURT: I WILL SUSTAIN AND STRIKE THE LAST ANSWER.
MS. CHABER: Q. SO HOW DID YOU GO ABOUT MAKING --
THE COURT: I WILL LEAVE IN THE PORTION OF THE ANSWER THAT SAYS, "I READ SOME OF THE MATERIAL BRIEFLY. I WAS SENT A VARIETY OF DEPOSITIONS. I READ THEM."
I WILL LEAVE THAT PORTION IN AND STRIKE THE BALANCE.
MS. CHABER: RIGHT. OKAY.
Q. AND THEN, HOW DID YOU GO ABOUT MAKING YOUR ANALYSIS?
A. IT WAS ULTIMATELY SIMPLE. IT WAS SO OBVIOUS, I SPENT MOST OF THE TIME THINKING ABOUT HOW TO PRESENT IT.

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Q. WHAT WAS OBVIOUS?
A. MAYBE I COULD PUT THAT UP.
Q. WHAT WERE THE FACTORS THAT YOU CONSIDERED, IN OTHER WORDS?
A. CAN I MARK THIS AS "INCOMPLETE"?
Q. THERE'S A NUMBER 5 ON THAT; CORRECT?
A. 5, 6 AND 7.
Q. WE'LL JUST GO TO THE NEXT PAGE.
A. THERE ARE SOME KEY THINGS. THERE ARE SOME KEY THINGS. (WRITING ON BOARD)
"THE PATIENT HAS LUNG CANCER (OR MOST PROBABLY,)" THE WAY I SAW IT.
Q. AND WHAT DID YOU DO TO REACH THAT CONCLUSION?
A. WELL, I NOTED THAT THERE WAS A CLINICAL HISTORY. CLINICIANS HAD EXAMINED HER. THERE WAS A PATHOLOGY REPORT AND THE EVIDENCE WAS THAT IT WAS LUNG CANCER.
NOW, I'M NOT A PATHOLOGIST, I'M NOT A CLINICIAN, BUT I DO STUDIES WHERE I LOOK AT INFORMATION LIKE THAT. WHEN I SEE INFORMATION LIKE THAT, IN MY JUDGMENT, IT'S MOST PROBABLY A LUNG CANCER.
OBVIOUSLY, I'M NOT DIAGNOSING MYSELF THE PATIENT. THIS IS THE WAY THE EVIDENCE SEEMED TO ME AS AN EPIDEMIOLOGIST.
Q. AND THOSE ARE EVALUATIONS AND CONSIDERATIONS THAT YOU HAVE TO MAKE AS AN EPIDEMIOLOGIST IN ORDER TO KNOW WHERE TO CLASSIFY A RESULT?
A. YES. EVERY PATIENT IN OUR STUDY, SOMETIMES WE JUST HAVE DEATH CERTIFICATE INFORMATION ABOUT THE

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DIAGNOSIS. SOMETIMES WE HAVE THAT PLUS THE MEDICAL RECORDS. AND SOMETIMES -- IT'S IN THE STUDY I REFERRED TO -- WE ALSO GET A PATHOLOGY BIOPSY REPORT. AND SOMETIMES WE ACTUALLY THEN GET THE BIOPSY ITSELF.
SO IT VARIES. BUT IN EVERY STUDY, I HAVE TO MAKE A DECISION ABOUT WHAT ARE THE CRITERIA THAT WE'LL USE FOR DIAGNOSIS FOR THE PATIENT TO BE IN THE STUDY.
Q. WHAT WAS THE NEXT FACTOR YOU CONSIDERED?
A. NO. 2. "THE PATIENT SMOKED FOR MANY YEARS."
Q. WHY IS THAT SIGNIFICANT?
A. THE OVERWHELMING EVIDENCE IS THAT THE LARGE MAJORITY OF LUNG CANCERS ARE CAUSED BY SMOKING.
Q. OKAY.
A. SO BASED ON THIS, NO. 3 IS: "IF IT WERE A LUNG CANCER, SMOKING CAUSED IT."
AND 4: "IF IT WERE MOST PROBABLY A LUNG CANCER, SMOKING MOST PROBABLY CAUSED IT."

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Q. NOW, CAN YOU EXPLAIN THE DIFFERENCE BETWEEN 3 AND 4?
A. YES. SOMETIMES, AT THE END AT THE INDIVIDUAL LEVEL, THERE'S NOT ABSOLUTE CERTAINTY ON A DIAGNOSIS.
IN THIS INSTANCE, I'D SAY, "WELL, IF IT'S A LUNG CANCER, NO QUESTION. MOST PROBABLY, ALMOST CERTAINLY SMOKING CAUSED IT, IF IT'S MOST PROBABLY A LUNG CANCER."
BUT THERE'S STILL SOME DOUBT, AND THEN IT COMES TO THIS STATEMENT (INDICATING), THAT IF IT'S MOST PROBABLY A LUNG CANCER, IT'S MOST PROBABLY THAT SMOKING CAUSED IT.
SO IT LINKS DIRECTLY BACK TO WHETHER IT'S MOST

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ABSOLUTELY A LUNG CANCER OR MOST PROBABLY A LUNG CANCER.
Q. OKAY. IS THAT THE END OF THE FACTORS THAT GET CONSIDERED AS A BROAD TOPIC?
WE CAN TALK ABOUT THEM SPECIFICALLY.
A. YES. THERE'S NOTHING TO ME TECHNICALLY MORE THAN THESE KEY POINTS, AND IT'S VERY OBVIOUS. SO ALTHOUGH ONE COULD TALK FOR TWO HOURS ABOUT ALL THE BASES OF ALL THESE REASONINGS, THAT'S IT. IT'S VERY SIMPLE.
Q. WELL, I PROMISED THE COURT I WOULDN'T DO THAT.
I WANT TO ASK YOU WHETHER YOU TOOK INTO ACCOUNT BIAS IN ANALYZING WHETHER OR NOT SMOKING CAUSED OR WAS THE MOST PROBABLE CAUSE OF MS. HENLEY'S CANCER?
A. I DID.
Q. AND TELL US HOW THAT AFFECTED YOUR DETERMINATION.
A. IT'S NOT RELEVANT AT ALL.
Q. WHY NOT?
A. THE RELATIONSHIP BETWEEN SMOKING AND LUNG CANCER IS VERY STRONG. IT'S BEEN CONSISTENTLY SHOWN FROM COUNTRY TO COUNTRY WORLDWIDE.
WHEN WE HAVE RISKS FOR A CANCER THAT IS AS STRONG AS THAT, THAT ARE SHOWN CONSISTENTLY, THE IDEA THAT IN TRUTH THERE'S ANOTHER CAUSE BECOMES RIDICULOUS, AND HAS BEEN RIDICULOUS FOR MANY YEARS.
Q. NOW, LET ME ASK YOU --
A. IT DOESN'T -- CAN I JUST MAYBE ADD TO THAT?
Q. YES.
A. IT DOESN'T MEAN TO SAY THERE MIGHT NOT BE SOME

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OTHER FACTOR THAT IS JOINTLY INVOLVED. THAT IS POSSIBLE.
SO I DON'T WANT TO BE MISUNDERSTOOD THERE. I'M NOT SAYING THAT I WOULD AFFIRM THAT IN EVERY LUNG CANCER THAT SMOKING WAS THE ONLY CAUSE.
BUT CERTAINLY, IT IS A CAUSE, AND THE PREDOMINANT CAUSE IN THE GENERAL POPULATION OF LUNG CANCERS.
Q. IN ANALYZING THAT, DO YOU TAKE INTO CONSIDERATION WHETHER OR NOT SOMEONE'S DIET, THE WAY THEY EAT, THE TYPES OF FOOD THEY EAT, WHETHER OR NOT THAT IS A FACTOR?
A. NO.
Q. WHY NOT?
A. WELL, IT IS TRUE THAT DIET MAY MODIFY RISK. IN OTHER WORDS, SOME PEOPLE MAY HAVE A GREATER IMPACT OF SMOKING BECAUSE OF LOW CONSUMPTION OF, SAY, FRUITS AND VEGETABLES, BUT THAT IN NO WAY MEANS THAT SMOKING DIDN'T CAUSE IT. THAT JUST MEANS THAT THEIR DIET MAY HAVE MODIFIED THE RISK.
SO IT'S JUST NOT RELEVANT TO CONSIDERING WHETHER OR NOT SMOKING WAS INVOLVED IN CAUSATION OF THE LUNG CANCER.
Q. WHAT ABOUT SOMETHING LIKE EXERCISE OR LACK OF

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EXERCISE?
A. IT'S RIDICULOUS. EXERCISE DOESN'T CAUSE LUNG CANCER. NOW, ASSOCIATED WITH PEOPLE WHO EXERCISE, YOU OFTEN FIND BETTER DIETS. IT MAY MODIFY THEIR RISKS, BUT IT IN NO WAY ALTERS WHETHER OR NOT SMOKING ACTUALLY CAUSES THE LUNG CANCER.
Q. IS IT TRUE IF THE PERSON DOESN'T EXERCISE AND IS MORE SEDENTARY?

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A. CORRECT.
Q. YOU MENTIONED YOU WERE STUDYING DIESEL.
DIESEL EMISSIONS, OR WHAT IS IT?
A. WELL, WE WERE STUDYING DIESEL EXHAUST EXPOSURE TO WORKERS WHO WERE WORKING INSIDE BUILDINGS WHERE THEY ARE RUNNING DIESEL ENGINES. SO THEY HAD HIGH DIESEL EXHAUST EXPOSURE IN PAST YEARS.
AND OUR WORK FOR THE CALIFORNIA EPA WAS TO WORK OUT WHETHER OR NOT THERE WAS EVIDENCE THAT DIESEL EXHAUST COULD CAUSE LUNG CANCER.
Q. AND CAN IT?
A. WELL, WE THINK SO. IT'S NOWHERE NEAR AS BIG A RISK AS SMOKING. SO IT'S MUCH HARDER TO BE SURE ABOUT.
THE RISKS ARE ROUND ABOUT 30, 40, 50 PERCENT IN LUNG CANCER RATES IN THOSE WORKERS.
AND SO MANY STUDIES -- WE PULLED TOGETHER ABOUT 22 STUDIES, AND WE THINK THERE PROBABLY IS A RELATIONSHIP. WE THINK THERE PROBABLY IS.
Q. DOES THAT DEPEND UPON WHETHER YOUR WORKERS ARE BEING EXPOSED TO HIGH LEVELS OR DOES THAT THEN APPLY TO, YOU KNOW, THE GENERAL POPULATION THAT'S WALKING AROUND BREATHING EXHAUST FUMES?
A. WELL, THE STUDIES ARE OF THE HIGH EXPOSURES. THE REASON WE WERE FUNDED TO DO THAT WORK WAS THAT THE CALIFORNIA EPA IS INTERESTED IN REGULATING CITY AIR POLLUTION.
NOW, WHAT THEY THEN DO IS EXTRAPOLATE DOWN TO THE MUCH LOWER EXPOSURES IN URBAN AIR FROM THE INFORMATION WITH

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THESE RELATIVELY HIGH WORKER EXPOSURES.
Q. IS THERE EVIDENCE THAT DIESEL EXHAUST IN THE AIR THAT WE BREATHE OUTSIDE CAUSES LUNG CANCER?
A. WELL, IT MAY DO IT, BUT IF IT DOES, IT'S NOT THAT COMMON. WE CAN'T PROVE WHETHER OR NOT IT REALLY DOES.
THE RISK ESTIMATES ARE THAT POSSIBLY ON THE ORDER OF ONE IN 1,000 PEOPLE MIGHT GET A LUNG CANCER TO WHICH DIESEL EXHAUST CONTRIBUTED IN INNER URBAN AIR, BUT THAT RISK IS VERY, VERY LOW COMPARED TO SMOKING AND LUNG CANCER.
IT'S NOT THE SORT OF RISK WE CAN PROVE SCIENTIFICALLY TO KNOW WHETHER IT IS REAL OR NOT. IT MAY BE OR MAY NOT BE.
Q. WHAT ABOUT AIR POLLUTION? IF YOU LIVE IN THE CITY, IS THERE MORE LUNG CANCER THAN IF YOU LIVE IN A RURAL AREA?
A. WELL, THERE IS SOME HIGHER RATES OF LUNG CANCER IN URBAN POPULATIONS IN MANY COUNTRIES, BUT THE PREDOMINANT CAUSE OF THAT IS THE SMOKING RATES STARTED OFF HIGHER IN URBAN AREAS.
NOW, THERE IS REASON TO BELIEVE THAT MAYBE THERE ARE SOME RISKS FROM URBAN AIR POLLUTION IN CAUSING SOME LUNG CANCERS. AGAIN, THE RISKS ARE QUITE LOW.
THE REGULATORS HAVE TO ACT AS IF MAYBE THEY MIGHT

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BE REAL, BUT IT'S VERY HARD TO PROVE WHETHER THEY ARE OR NOT.

Q. AND IF AN INDIVIDUAL WAS A CIGARETTE SMOKER AND ALSO LIVED IN AN URBAN ENVIRONMENT, IS THERE A WAY TO SAY THAT SMOKING CAUSED THE LUNG CANCER IN THAT INDIVIDUAL OR

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IT'S THE AIR POLLUTION, OR YOU CAN'T MAKE THAT DETERMINATION?

A. YES, YOU CAN. I MEAN, CERTAINLY IT'S THE SMOKING THAT CAUSED THE CANCER.

NOW, THERE IS A POSSIBILITY THAT SOME CHEMICALS CALLED PAH'S THAT ARE ALSO IN URBAN AIR CONTRIBUTED A LITTLE BIT TO THE DOSE. BUT THE OVERWHELMING DOSE IN SUCH A PERSON WHO GOT LUNG CANCER WOULD HAVE COME FROM THEIR SMOKING, BUT THEY DRAW A VERY CLEAR ANSWER.

WHETHER OR NOT A CONTRIBUTION TO THE DOSE THAT CAUSED IT CAME FROM URBAN AIR WOULD BE A MATTER OF SCIENTIFIC DEBATE, THEORETICAL SPECULATION IN PART.

BUT, NO, THE SMOKING WOULD BE THE OVERRIDING CLEAR-CUT DECISION ONE COULD MAKE ABOUT IT.

Q. AND THERE ARE PAH'S PRODUCED WHEN YOU INHALE ON A CIGARETTE; CORRECT?

A. YES, INDEED, VERY HIGH LEVELS OF DIFFERENT ONES, ESPECIALLY BENZOPYRENE.

MS. CHABER: DO YOU WANT TO TAKE THE LUNCH BREAK?

THE COURT: DO YOU WANT TO GO TO LUNCH?

MS. CHABER: YES.

THE COURT: OKAY. JURORS, OVER THE NOON HOUR, PLEASE CONTINUE TO FOLLOW THE ADMONITION. YOU KNOW IT'S CRITICAL. WE'LL SEE YOU BACK AT 1:30.

HAVE A GOOD LUNCH. WE'LL SEE YOU AT 1:30.

(LUNCH RECESS TAKEN AT 12:00 NOON)

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AFTERNOON SESSION 1:35 P.M.

FRIDAY, JANUARY 22, 1999

(THE FOLLOWING PROCEEDINGS WERE HELD IN THE COURTROOM, IN THE PRESENCE OF THE JURY)

THE COURT: OKAY. GOOD AFTERNOON, EVERYBODY. WE'RE BACK ON THE RECORD.

YOU MAY PROCEED, MS. CHABER.

MS. CHABER: THANK YOU.

CONTINUED DIRECT EXAMINATION

BY MS. CHABER: Q. BEFORE BE BROKE FOR LUNCH, WE WERE TALKING ABOUT OTHER THINGS THAT POTENTIALLY COULD CAUSE LUNG CANCER WHICH MIGHT CONFOUND, I THINK WAS THE WORD YOU USED, AN ANALYSIS OF WHETHER SMOKING CAUSED A LUNG CANCER.

A. YES.

Q. WHILE YOU WERE GETTING YOUR PH.D., DID YOU HAVE TO ANALYZE AND PRESENT INFORMATION ABOUT SMOKING DURING THE COURSE OF THAT?

A. YES, I DID BOTH. PART OF MY PH.D. WORK WAS DIRECTLY ON SMOKING AND SOME PERIPHERAL VASCULAR EFFECTS.

AND THE TIMES I GAVE LECTURES IS WHEN I ALREADY HAD MY M.D. I WAS STUDYING FOR A PH.D.

Q. AND WHAT WERE THE TOPICS THAT YOU WOULD LECTURE ON?

A. WELL, I REMEMBER THE FIRST LECTURE I GAVE, I

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THINK, IN MY PROFESSIONAL CAREER WAS ON LUNG CANCER. MY
PROFESSOR ASKED ME IF I WOULD PREPARE A LECTURE ON LUNG

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CANCER AND THE EVIDENCE RELATING TO SMOKING AND THE CAUSES
OF IT. I THINK IT WAS IN 1972 OR VERY CLOSE TO THAT, 1972.
HE GAVE ME A VOLUME OF MATERIAL THAT HE HAD ON
THE TOPIC AND ON MANY OTHER DIFFERENT TOPICS. HE SAID "HERE
IS A VOLUME OF SMOKING INFORMATION."
I STUDIED IT AND GAVE THE LECTURE.
Q. AND WHAT TYPES OF THINGS DID YOU ANALYZE IN THAT
LECTURE?
A. WELL, I GAVE THE LECTURE ON THE EVIDENCE THAT WAS
VERY CLEAR, THAT SMOKING CAUSED LUNG CANCER, AND THEN
PRESENTED THE VARIOUS ALTERNATIVE THEORIES AND WHAT I
DESCRIBED AS QUAINT HYPOTHESES THAT WERE PUT FORWARD TO TRY
AND CONCEAL THE RELATIONSHIP BETWEEN SMOKING AND LUNG
CANCER.
Q. AND WHAT WERE THOSE QUAINT HYPOTHESES?
A. I REMEMBER THREE. THERE WERE OTHERS, I KNOW, BUT
THE THREE THAT CAME TO MIND WHEN I WAS THINKING ABOUT IT,
ONE WAS THAT IT'S NOT THE SMOKING, IT'S THE PERSONALITY TYPE
THAT TAKES UP SMOKING, AND IT'S PERSONALITY OR SOMETHING TO
DO WITH YOUR LOGIC SYSTEM THAT CAUSED THE LUNG CANCER. THAT
WAS PUT FORWARD, THAT PEOPLE WHO SMOKE ARE DIFFERENT IN
THEIR PERSONALITIES AND THAT'S WHY THEY GET LUNG CANCER.
ANOTHER ONE WAS THAT THE RISKS AT THAT TIME
APPEARED IN ENGLAND TO BE HIGHER FOR THE SAME CIGARETTE
SMOKING THAN IN THE U.S. IT WAS SUGGESTING THAT'S EVIDENCE
THAT SMOKING DOESN'T CAUSE LUNG CANCER.
SUBSEQUENTLY -- THE EVIDENCE WAS NOTED IN ENGLAND
AT THAT TIME THAT APPARENTLY THEY SMOKED RIGHT DOWN TO THE

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BUTT. THEY COULDN'T AFFORD THE CIGARETTES. IT WAS RIGHT
DOWN TO THE END, WHERE THE LIPS WERE ALMOST BURNING.
IN THE U.S., WHERE THEY COULD AFFORD TO PAY
BETTER, THEY PROBABLY DIDN'T SMOKE RIGHT DOWN. THAT WAS THE
PROBABLE EXPLANATION.
BUT NEVERTHELESS, IT WAS PUT FORWARD AS AN IDEA.
"WELL, THIS DOESN'T FIT. THEREFORE, SMOKING DOESN'T CAUSE
LUNG CANCER."
THE THIRD ONE I REMEMBER VERY DISTINCTLY BECAUSE
I'M NOW WORKING ON ARSENIC. AT THAT TIME, THEY USED
ARSENICAL PESTICIDES ON TOBACCO. AND SO THEY SAID, "WELL,
IT'S THE ARSENIC FROM THE PESTICIDES THAT'S CAUSING THESE
LUNG CANCERS, NOT THE TOBACCO, AND WE'LL JUST STOP USING
ARSENIC PESTICIDES AND THE RISKS WILL GO AWAY."
THOSE WERE THREE OF THESE WHAT I'VE DESCRIBED AS
RED HERRING DIVERSION THEORIES THAT WERE PUT FORWARD AT THAT
TIME AGAINST SMOKING CAUSING LUNG CANCER.
Q. WERE THESE THEORIES THAT WERE PUT FORWARD IN
NEWSPAPERS AND MAGAZINES?
A. WELL, SOME WERE IN NEWSPAPERS. SOME WERE IN
JOURNAL ARTICLES.
THE COLLECTIONS MY PROFESSOR HAD ON ALL THESE
TOPICS OF INTEREST CONSISTED OF CUTTINGS FROM VARIOUS
SOURCES, JOURNAL ARTICLES, NEWSPAPERS, MANY OF THEM FROM
NEWSPAPERS REPORTING ON TOBACCO COMPANY STATEMENTS OR THE
TOBACCO INSTITUTE STATEMENTS.
Q. AND DO YOU CONTINUE TO USE THE TOPIC OF SMOKING
IN TEACHING EPIDEMIOLOGY AT THE SCHOOL OF PUBLIC HEALTH AT

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BERKELEY?

A. I DO.

Q. AND HOW DO YOU USE IT?

A. WELL, THERE ARE VARIOUS PLACES IT COMES IN. OBVIOUSLY, I DON'T TALK NOW ABOUT THE EVIDENCE OF SMOKING CAUSING LUNG CANCER. THAT IS OLD STUFF.

BUT I DO, IN THE RISK CLASSES, MAKE SURE STUDENTS APPRECIATE WHAT THESE RISKS ARE, THAT FOR REGULAR SMOKERS, OF THE ORDER OF TWO OUT OF FIVE SMOKERS WILL DIE FROM SMOKING.

SO THAT WHEN THEY'RE TALKING ABOUT OR THINKING ABOUT OTHER RISKS, LIKE AIR POLLUTION OR BENZENE, A CHEMICAL THAT CAUSES LEUKEMIA OR OTHER THINGS THEY'RE CALCULATING, THEY ARE AWARE OF THE STARK CONTRAST BETWEEN THAT AND THE RISKS THAT AROSE FROM SMOKING OR DO ARISE FROM SMOKING.

ANOTHER AREA IS, IN WORKPLACE STUDIES AND IN OTHER AREAS WHERE WE'RE LOOKING FOR LUNG CANCER, WE HAVE TO BE CONCERNED ABOUT SMOKING MIGHT EXPLAIN SOME WORKPLACE INCREASED RISKS SO IN STUDY DESIGN, WE CONSIDER THAT AND HOW TO INTERPRET IT.

SO THAT IF YOU REACH A CONCLUSION ABOUT A CHEMICAL IN INDUSTRY MAY BE CAUSING LUNG CANCER, THEY ARE AWARE OF HOW TO DEAL WITH THIS "CONFOUNDING." SMOKING MAY BE THE REAL EXPLANATION, IF YOU'RE NOT CAUTIOUS.

THE THIRD ONE IS AN AREA WHERE WE DO TEACHING RESEARCH. THAT IS WHAT I MENTIONED BEFORE. SMOKING AND OTHER AGENTS MAY ENHANCE ITS EFFECTS OR ACT SYNERGISTICALLY WITH IT.

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ASBESTOS IS AN EXAMPLE OF THAT, A CLASSIC EXAMPLE, AND I TEACH ABOUT THAT. WE'RE DOING RESEARCH ON THAT AND I TEACH ABOUT THAT.

Q. NOW, IN TERMS OF QUITTING SMOKING, HAVE YOU LOOKED AT THE RISKS AND THE REDUCTION IN RISK FROM QUITTING SMOKING?

A. YES.

Q. AND CAN YOU TELL US ABOUT THAT.

A. YES. THE STUDIES -- I CAN'T REMEMBER EXACTLY WHEN THE FIRST ONES WERE. MAYBE 20 YEARS AGO WE STARTED FINDING OR FOLLOWING PEOPLE WHO STOPPED SMOKING COMPARED TO THOSE WHO CONTINUED. AND THERE HAVE BEEN MANY STUDIES NOW LIKE THAT, QUITE A FEW, THAT GIVE INFORMATION ABOUT HOW THE RISKS COMPARE BETWEEN THE CONTINUING SMOKERS AND THOSE THAT DROP IT.

AND IN MY OPINION, THE DIFFERENCE BETWEEN THEM STARTS AROUND THREE, FOUR, ABOUT FIVE YEARS. I THINK THERE'S A BEGINNING OF LOWER LUNG CANCER RISK IN THOSE WHO STOP SMOKING. BY 10 YEARS, IT'S VERY CLEAR. AND 20 YEARS, IT'S STARTING TO GET COMPARED TO WHAT IT WAS NEARER THAT OF NONSMOKERS.

BUT IT REMAINS CLEARLY ABOVE THAT OF NONSMOKERS, IN MY VIEW, LOOKING AT STUDIES OVERALL AT 20 YEARS AND 25 YEARS, EVEN AFTER STOPPING. BUT IT'S MUCH CLOSER, OF COURSE, TO NONSMOKERS THAN IT IS BY THEN TO THE PEOPLE WHO CONTINUE TO SMOKE.

Q. SO YOU KNOW CLEARLY THERE'S A BENEFIT FROM QUITTING SMOKING, BUT DOES THE PERSON WHO QUIT SMOKING EVER

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GET BACK TO THE LEVEL OF A NONSMOKER?

A. WELL, THAT IS NOT CLEAR.

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NOW, WHAT IS CLEAR WITH HEART DISEASE IS THEY BENEFIT VERY QUICKLY IN STOPPING SMOKING.

MR. BARRON: YOUR HONOR, I THINK THAT IS NONRESPONSIVE.

THE COURT: YES. I THINK YOU'VE ANSWERED THE QUESTION. I THINK THE QUESTION YOU ASKED DIDN'T HAVE ANYTHING TO DO WITH THE HEART.

DO YOU WANT ME TO STRIKE THE REFERENCE TO THE HEART AND LEAVE IN THE REST?

MR. BARRON: YES, YOUR HONOR.

THE COURT: ALL RIGHT. THAT'S WHAT I'M DOING.

MS. CHABER: Q. YOU SAID IT'S NOT CLEAR.

WHAT DID YOU MEAN BY "IT'S NOT CLEAR"?

A. I GUESS I WASN'T CLEAR ON THE QUESTION. JUST ON LUNG CANCER, DO I UNDERSTAND?

Q. I WAS ASKING YOU ABOUT THE RISKS FROM SMOKING. LET ME CLARIFY.

IN ADDITION TO THE RISK FROM SMOKING WITH RESPECT TO LUNG CANCER, ARE THERE RISKS OF OTHER DISEASES AS WELL?

A. YES.

Q. AND WHAT DISEASES ARE WE TALKING ABOUT?

A. THE CARDIOVASCULAR DISEASES, HEART ATTACKS. SOME OF THE MAIN ONES ALSO, WHAT WE CALL PERIPHERAL VASCULAR DISEASE. THE ONE --

MR. BARRON: I DON'T MEAN TO INTERRUPT, BUT THIS IS CUMULATIVE. HAVEN'T WE BEEN THROUGH ALL THIS?

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MS. CHABER: I HAVEN'T DEALT WITH THE QUITTING ISSUE.

THE COURT: DIDN'T YOU ASK OTHER WITNESSES ABOUT THE RISKS AFTER PERIODS OF TIME WITH RESPECT TO --

MS. CHABER: NO. THAT WAS CROSS-EXAMINATION BY THEM. I DID NOT ASK THAT.

THE COURT: ALL RIGHT. IF THAT'S TRUE, YOU CAN GO AHEAD.

MS. CHABER: Q. WITH RESPECT TO THE RISKS FOR DISEASE FROM SMOKING FROM QUITTING CIGARETTES, DOES THE RISK TO THE INDIVIDUAL WHO WAS A SMOKER BUT QUIT EVER GET BACK TO THE LEVEL OF A NONSMOKER?

A. WELL, IN MY OPINION, AS FAR AS LUNG CANCER GOES, IT'S NOT ABSOLUTELY CLEAR. IT IS CLEAR THAT BY ABOUT 30 YEARS, IN MY OPINION, IT'S GETTING PRETTY CLOSE, BUT TO BE ABSOLUTELY SURE IS VERY HARD.

IT'S ALSO MY OPINION THAT 20 YEARS AFTER STOPPING, THERE'S STILL INCREASED RISKS OF LUNG CANCER. AND SO I DON'T KNOW IF -- IT'S NOT ABSOLUTELY CLEAR TO ME IF IT DEFINITELY GETS RIGHT BACK TO NONSMOKERS.

THERE IS NO GOOD EVIDENCE IN MY VIEW THAT WOULD ALLOW ONE TO CONCLUDE THAT, BUT IT DOES GET, AFTER A LONG PERIOD OF TIME, QUITE CLOSE.

Q. AND AFTER 20 YEARS, WHEN YOU SAY IT'S CLOSER BUT THERE'S STILL A RISK, WHAT TYPE OF MAGNITUDE OF RISK ARE WE TALKING ABOUT THAT STILL EXISTS TO THE QUIT SMOKER 20 YEARS OUT?

A. IT'S THE ORDER OF A TWOFOLD RISK. SOME STUDIES

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DON'T FIND -- THREEFOLD SOMETIMES. SOME ACTUALLY DON'T FIND ANY INCREASED RISK. BUT THE OVERALL OR MAJORITY OF STUDIES AND THE LARGE ONES STILL FIND INCREASED RISK.

NOW, IT DOES DEPEND ON HOW MUCH YOU SMOKE A DAY TO START WITH, AND IN THE MORE-THAN-A-PACK-A-DAY SMOKERS,

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SOME STUDIES STILL FIND TWO, THREE OR FOURFOLD RISK AFTER 20 YEARS. SOME FIND LESS THAN THAT.

Q. AND A TWO, THREE OR FOURFOLD RISK, IS THAT STILL A VERY SUBSTANTIAL AND SIGNIFICANT RISK?

MR. BARRON: OBJECTION, YOUR HONOR. VAGUE AND AMBIGUOUS.

THE COURT: SUSTAINED.

MS. CHABER: Q. HOW WOULD YOU DESCRIBE THE LEVEL OF MAGNITUDE OF RISK THAT THERE IS A TWOFOLD, THREEFOLD, FOURFOLD RISK TO THE 20-YEAR QUIT SMOKER OF MORE THAN A PACK A DAY?

A. FOURFOLD, THAT'S FAIRLY HIGH. IN CURRENT CONTINUING SMOKERS, FOR EXAMPLE, THE RISK OF BLADDER CANCER IS ABOUT TWO TO FOURFOLD. AND I REGARD THAT AS HIGH RISK IN TERMS OF A CANCER-CAUSING SUBSTANCE.

MS. CHABER: THANK YOU. I HAVE NO FURTHER QUESTIONS.

THE COURT: OKAY. MR. BARRON.

MR. BARRON: YES. THANK YOU, YOUR HONOR.

CROSS-EXAMINATION

BY MR. BARRON: Q. GOOD AFTERNOON, DOCTOR.

A. GOOD AFTERNOON.

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Q. I'LL TAKE A SECOND SO I CAN BE ABLE TO ADDRESS SOME DOCUMENTS WITH YOU.

THE COURT: OH, ACTUALLY, BEFORE YOU START, IF DR. SMITH IS DONE DOING HIS DRAWINGS -- I THINK THERE ARE TWO PAGES OF THOSE DRAWINGS UP THERE.

MS. CHABER: THERE'S THE FIRST INCOMPLETE PAGE AND THE SECOND PAGE.

THE COURT: LET'S MARK THOSE. IF THERE'S NOT GOING TO BE ANY MORE DRAWING, LET'S MARK THOSE TWO PAGES AS PLAINTIFF'S 61 FOR IDENTIFICATION.

(DOCUMENT MORE PARTICULARLY DESCRIBED IN THE INDEX MARKED FOR IDENTIFICATION PLAINTIFF'S EXHIBIT # 61)

THE COURT: FOR THE RECORD, WAS THAT TWO PAGES, TATSUO?

THE CLERK: I BELIEVE SO.

THE COURT: OKAY, THAT'S TWO PAGES.

OKAY. MR. BARRON.

MR. BARRON: THANK YOU, YOUR HONOR.

Q. DOCTOR, AM I CORRECT THAT EPIDEMIOLOGY MEANS A STATISTICAL STUDY OF HUMAN HEALTH AND DISEASE?

A. NO, I WOULDN'T WORD IT THAT WAY. IT INCLUDES STATISTICS, BUT THAT'S NOT ITS DEFINITION.

Q. HAVE YOU SEEN IT DESCRIBED THAT WAY IN SURGEON GENERAL'S REPORTS?

A. I HAVE SEEN REFERENCE TO IT BEING MADE, THAT PART OF IT, BUT I DON'T RECALL SEEING THAT SPECIFIC PHRASE IN THE

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SURGEON GENERAL'S REPORTS.

Q. DO YOU AGREE THAT ONE OF THE THINGS THAT EPIDEMIOLOGY DOES IS TO TRY TO LOOK FOR AND DISCOVER ANYTHING THAT HAS A STATISTICAL RELATIONSHIP WITH DISEASE?

A. I WOULDN'T WORD IT THAT WAY, COUNSEL. IT IS PART OF IT, AND STATISTICS, BUT WHAT WE DO IS TRY WORK OUT THE CAUSES OF DISEASE IN HUMANS.

Q. DON'T YOU HAVE TO START IN YOUR EPIDEMIOLOGICAL

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WORK BY LOOKING AT STATISTICAL ASSOCIATIONS? DO YOU USE EPIDEMIOLOGY TO GO OUT AND TRY TO DISCOVER, FOR EXAMPLE, THE MECHANISM BY WHICH A DISEASE LIKE CANCER IS CAUSED?

A. YES.

Q. YOU'VE DONE THAT?

A. I DO IT ALL THE TIME. WE DO STUDIES WHERE WE GET TUMORS. WITH MY COLLEAGUES, WE EXAMINE THE DNA PATTERNS, TRY TO FIND THE MUTATIONS THAT MIGHT RELATE TO CERTAIN CHEMICALS.

WE ALSO LOOK AT THE ROUTE OF CHEMICALS GETTING TO DIFFERENT SITES. WE ALSO LOOK AT CHANGES IN CELLS.

FOR EXAMPLE, IN OUR BLADDER CANCER WORK, WE COLLECT BLADDER CELLS AND LOOK FOR GENETIC CHANGES. IN ALL THAT WORK, WE'RE TRYING TO WORK OUT THE -- NOT ONLY WHETHER OR NOT THE AGENT CAUSES THE DISEASE, BUT SOME OF THE MECHANISMS BY WHICH IT DOES IT.

Q. IN ANY EVENT, AT SOME POINT, WHATEVER YOU LOOK AT, YOU TRY TO OFFER SOME INFORMATION ABOUT WHETHER SOMETHING IS A RISK FACTOR FOR SOMETHING ELSE? IN OTHER WORDS, FOR EXAMPLE, WHETHER AN AGENT OR A COURSE OF CONDUCT

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IS A RISK FACTOR FOR A PARTICULAR DISEASE, CORRECT?

A. THAT IS PART OF IT, YES, COUNSEL, BUT IT'S NOT THE KEY PART.

Q. ISN'T THIS HOW YOU DEFINE "RISK FACTOR"; SOMETHING THAT HAS A HIGHER STATISTICAL ASSOCIATION WITH A DISEASE?

A. NO.

Q. HOW DO YOU DEFINE IT?

A. VARIOUS WAYS. AND IT HAS CHANGED A LITTLE BIT OVER THE YEARS.

THE RISK FACTOR IS A FACTOR WHICH APPEARS IN A SERIES OF POPULATIONS TO BE RELATED TO INCREASED RISKS OF A DISEASE. WE DON'T USE IT JUST AS A FACTOR THAT IN SOME STUDY FOUND INCREASED RISKS, AND WE ALSO RESERVE IT FOR ONES WHERE THERE'S EVIDENCE OF A CAUSAL LINK.

THERE IS A TERM THAT WE -- OR SOME OF US USE CALLED A RISK INDICATOR, WHICH WOULD JUST BE A FACTOR THAT HAPPENED TO HAVE A STATISTICAL RELATIONSHIP.

BUT THE WORD "RISK FACTOR" WE'RE USING MUCH MORE IN RELATIONSHIP TO IT LIKELY BEING A CAUSAL FACTOR.

Q. WELL, IF WE TAKE SOMETHING -- LET'S TAKE A DISEASE LIKE YOU MENTIONED, HEART DISEASE.

YOU WOULD SAY THAT THERE ARE CERTAIN THINGS THAT ARE ASSOCIATED WITH A HIGHER RISK OF HEART ATTACK; CORRECT?

A. YOU COULD SAY THAT, YES.

Q. BUT YOU WOULDN'T NECESSARILY SAY THAT IN A PARTICULAR PATIENT'S CASE, JUST BASED ON THE STATISTICAL RELATIONSHIP, THAT THAT PATIENT DIED OF A HEART ATTACK

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BECAUSE OF THAT PARTICULAR RISK FACTOR; CORRECT?

A. YOU MIGHT. IT DEPENDS ON THE CIRCUMSTANCES.

THE EVIDENCE, FOR EXAMPLE, THAT HIGH BLOOD PRESSURE IS RELATED TO HEART ATTACKS, EPIDEMIOLOGY OBVIOUSLY HAS STUDIES OF PEOPLE.

THE EVIDENCE THAT SMOKING WAS INVOLVED, THE EVIDENCE THAT CHOLESTEROL MIGHT BE RELATED, COMES FROM EPIDEMIOLOGICAL STUDIES OF PEOPLE.

SO WHEN I THEN MAKE AN INFERENCE ABOUT ONE PATIENT WHO HAS A HEART ATTACK AND DIES FROM IT, THE QUESTION IS WHAT CAUSED THE HEART ATTACK, AND ONE DRAWS FROM

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THOSE POPULATION STUDIES IN DECIDING THAT, WELL, IT'S PROBABLE, IN THAT PERSON, CHOLESTEROL, SMOKING, LACK OF EXERCISE OR WHATEVER WERE INVOLVED IS A CAUSE OF IT.

Q. I'M NOT SURE WE'RE CONNECTING HERE. LET ME JUST ASK YOU THIS FOR AN EXAMPLE.

THERE ARE THINGS THAT WE KNOW ABOUT THAT ARE APPARENTLY RELATED IN TIME.

THAT DOESN'T NECESSARILY MEAN THAT ONE THING CAUSES THE OTHER; CORRECT?

A. I SUPPOSE, YES, I CAN THINK OF SOME.

Q. LIKE, FOR EXAMPLE, IF YOU'RE LIVING ON A FARM AND YOU HEAR A ROOSTER CROWING AND IT'S NOT LIGHT YET AND THEN THE SUN RISES, YOU COULD MAKE THE MISTAKE OF CONCLUDING, BECAUSE THERE'S A TEMPORAL RELATIONSHIP WITH THE ROOSTER ALWAYS CROWING AND THEN LATER ON THE SUN COMES UP, THAT SOMEHOW THE ROOSTER IS CAUSING THE SUN TO COME UP; RIGHT?

A. I WOULDN'T, BUT I CAN IMAGINE THE SITUATION.

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WE TALKED ABOUT WHAT WE CALL TEMPORAL SEQUENCE, WHAT THAT MEANS, HOW TO USE IT IN CAUSAL INFERENCE, WHEN YOU SAY -- I THINK IN YOUR QUESTION YOU SAID TO ME -- WELL, NO. WE WOULD CONSIDER CAUSE AND EFFECT MUCH MORE CAREFULLY.

THERE ARE STUDIES THAT LIGHT COMES UP AND AFFECTS THE PINEAL GLANDS, LITTLE GLANDS THAT WE ALL HAVE. AND THAT DOES LEAD TO THE EXCRETION OF A CHEMICAL CALLED MELATONIN THAT IS THOUGHT TO RELATE TO SOME BIRD BEHAVIOR SUCH AS THAT.

BUT NEVERTHELESS, I WOULD ALWAYS BRING IT RIGHT TO THE BIOLOGICAL RELATIONSHIP STUDY, ALL THE ASPECTS OF CAUSE AND EFFECT, AND BRING IN OTHER INFORMATION, NOT THAT JUST ONE THING HAPPENED FIRST.

Q. ANOTHER EXAMPLE YOU ARE PROBABLY AWARE OF -- BECAUSE YOU HAVE READ SOME DEPOSITIONS IN THE CASE, HAVEN'T YOU?

A. I SCANNED THEM.

Q. DO YOU REMEMBER A TIME WHEN, FOR A WHILE, PEOPLE THOUGHT WHEN WE HAD THAT TERRIBLE EPIDEMIC OF POLIO ABOUT THE TIME -- I GUESS YOU AND I ARE PROBABLY ROUGHLY THE SAME AGE -- WHEN WE WERE GROWING UP, THAT TERRIBLE EPIDEMIC OF POLIO, AND THERE WERE SOME PEOPLE THAT WERE STATING THAT IT WAS LIKE AS IF THE POLIO WAS BECAUSE OF INCREASED CONSUMPTION OF THESE NEW SOFT DRINKS, BECAUSE IT APPEARED THAT AT THE SAME TIME PEOPLE WERE DRINKING MORE SOFT DRINKS, THEY WERE GETTING MORE POLIO? DO YOU REMEMBER THAT?

A. NO.

Q. OKAY. DO YOU REMEMBER THAT IT TURNED OUT THAT

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WHAT HAPPENED WAS THAT THE REASON THERE WAS THAT ASSOCIATION BETWEEN INCREASED CONSUMPTION OF SOFT DRINKS AND INCREASED INCIDENCE OF POLIO IN YOUNGSTERS WAS THAT KIDS WERE DRINKING MORE SOFT DRINKS WHEN IT'S SUMMERTIME, IT'S HOTTER, AND THAT WAS THE TIME WHEN THE POLIO VIRUS SEEMED TO CAUSE ITS HAVOC TO A GREATER EXTENT BECAUSE OF WHAT THE POLIO BUG DOES? DOES THAT MAKE SENSE?

A. NO.

Q. OKAY. YOU ARE NOT AWARE OF THAT HISTORY?

A. NO. NO. I COULD TELL YOU EXAMPLES LIKE THAT, BUT NOT THAT PARTICULAR ONE, NO. I MEAN, PEOPLE --

Q. GIVE ME AN EXAMPLE, IF YOU WOULD, THAT YOU CAN REMEMBER LIKE THAT.

A. WELL, IT USED TO BE THOUGHT THAT BECAUSE PEOPLE

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WHO LIVED NEAR SWAMPS GOT MALARIA, THAT THERE'S SOMETHING ABOUT THE HUMAN AIR NEAR SWAMPS THAT CAUSES MALARIA.

IT HAPPENS THAT THAT IS A PART OF THE TRUTH IN THAT MOSQUITOS ARE NEAR THE SWAMPS. IT WAS LATER FOUND OUT THAT THAT WAS THE VECTOR THAT CAUSED IT.

BUT THE INITIAL ASSOCIATION LIKE THAT MAY HAVE WITHIN IT SOMETHING THAT RELATES TO CAUSE OR MAY NOT. YOU HAVE TO BE VERY CAUTIOUS ABOUT IT.

Q. DO YOU AGREE WITH ME, THEREFORE, THAT STATISTICAL METHODS CANNOT ESTABLISH PROOF OF A CAUSAL RELATIONSHIP IN SUCH AN ASSOCIATION?

MS. CHABER: I WOULD OBJECT TO THE "THEREFORE" AS ARGUMENTATIVE.

THE COURT: LET'S ASSUME THE QUESTION DIDN'T

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HAVE THE "THEREFORE" IN IT.

DID YOU UNDERSTAND THE QUESTION WITHOUT THE WORD "THEREFORE"?

WHY DON'T YOU REASK IT.

MR. BARRON: I WILL REASK IT. SURE, YOUR HONOR.

Q. DO YOU AGREE THAT STATISTICAL METHODS, DOCTOR, CANNOT ESTABLISH PROOF OF CAUSAL RELATIONSHIP IN AN ASSOCIATION?

A. I DO. IT TAKES EPIDEMIOLOGY.

Q. NOW, SPEAKING OF THAT, YOU TALKED ABOUT SOME EARLIER VIEWS OR OPINIONS OR HYPOTHESES, THEORIES -- I'M NOT SURE WHAT WORD YOU USED -- ABOUT CAUSES FOR LUNG CANCER FROM AN EPIDEMIOLOGICAL POINT OF VIEW. YOU CALLED THEM RED HERRINGS.

DO YOU REMEMBER THAT?

A. NO. YOU MISUNDERSTOOD ME, COUNSEL. IT WASN'T AN EPIDEMIOLOGICAL VIEW.

THESE WERE WHAT I AT THE TIME CALLED QUAINT IDEAS RAISED BY THE TOBACCO INDUSTRY.

Q. WELL, THAT'S WHY I BROUGHT IT UP.

DO YOU REMEMBER THE CONSTITUTIONAL HYPOTHESIS AS BEING PUT FORTH? THAT WAS THE ONE ABOUT SOMETHING WITH THE PEOPLE'S NERVOUS SYSTEM, THAT THAT WAS ACTUALLY PUT FORTH BY THE MAYO CLINIC?

A. I DON'T KNOW. I DON'T RECALL.

Q. DO YOU HAVE A DOCUMENT FROM A TOBACCO -- ACTUALLY, STRIKE THAT.

DO YOU HAVE A DOCUMENT, FIRST OF ALL, FROM PHILIP

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MORRIS, WHERE PHILIP MORRIS SAID THAT THEY WERE PUTTING FORTH THIS HYPOTHESIS AS THEIR PRODUCT OR WORK?

A. NO DOCUMENTS ON THAT NOW.

WHAT I DID RECALL AT THE TIME I READ THOSE THINGS, THAT MOST OF THEM WERE ORIGINATING FROM SCIENTISTS WHO WERE SUPPORTED BY TOBACCO COMPANIES.

BUT I CAN'T GO DOWN TO EVERY LAST LINE OF MY FIRST LECTURE THAT I THINK I GAVE MANY YEARS AGO.

Q. DOCTOR, IN FAIRNESS, YOU'VE TESTIFIED BEFORE IN COURT A NUMBER OF TIMES; CORRECT?

A. CORRECT.

Q. IN FACT, YOU'VE TESTIFIED, I THINK YOU ESTIMATED WHEN I TOOK YOUR DEPOSITION RECENTLY, OVER 100 TIMES?

A. CORRECT.

Q. AND BY THE WAY, IN TERMS OF YOUR WORK UNRELATED TO LEGAL EXPERT WORK -- AS I UNDERSTOOD THIS MORNING, YOU TOLD US THAT -- ACTUALLY, WHEN YOU WERE ASKED WHAT YOU DO

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OVER THERE AT BERKELEY, YOU GAVE US TWO THINGS. YOU GAVE US, NO. 1, TEACHING IS HOW YOU SPENT YOUR TIME, AND NO. 2 RESEARCH.

HOW MUCH OF YOUR TIME DO YOU SPEND TEACHING?

A. IT'S AROUND ABOUT 40 PERCENT TEACHING, 40 PERCENT IN RESEARCH. AND THEN I DO ADMINISTRATIVE THINGS, AND COMMITTEES AND THINGS LIKE THAT.

Q. YOU DIDN'T MENTION ANY EXPERT WORK THAT YOU DO IN THIS LEGAL FIELD.

HOW MUCH OF YOUR TIME IS SPENT DOING THAT?

A. IT'S ABOUT 10 OR 15 PERCENT. BUT A LOT OF IT IS

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ON WEEKENDS, AT NIGHTS.

WHEN I REFER TO WHAT I MAINLY DO, IT'S IN THE CONTEXT OF MY UNIVERSITY POSITION, WHICH DOES ALLOW US TO SPEND THE EQUIVALENT OF A DAY A WEEK DOING CONSULTING WORK.

Q. I'M SORRY. YOU SAID HOW MUCH OF YOUR TIME, 10 TO 15 PERCENT?

A. OF MY TOTAL WORK WEEK, YES.

Q. NOW, THAT COMPARES THOUGH, ACTUALLY, WITH THE FACT THAT YOUR INCOME IS GREATER FROM THAT THAN YOUR TEACHING BECAUSE, ACTUALLY, ONE-THIRD OF YOUR INCOME COMES FROM THIS LEGAL WORK, DOESN'T IT?

A. WELL, I DON'T HAVE A SEPARATE INCOME FOR TEACHING. MY INCOME AT THE UNIVERSITY IS FOR MY TOTAL APPOINTMENT.

IT IS TRUE, THOUGH, THAT AROUND ABOUT A THIRD OF MY INCOME DOES COME FROM MEDICAL/LEGAL CONSULTING.

Q. OKAY. BY THE WAY, I DO HAVE YOUR DEPOSITION HERE. I THOUGHT MAYBE YOU WERE SAYING SOMETHING MAYBE SLIGHTLY DIFFERENT.

BUT AS I REACH FOR IT, I HEARD WHAT WE HEARD AT THE DEPOSITION, SO LET ME JUST HAND IT TO YOU. I MIGHT HAVE TO REFER TO THAT LATER ON TO SAVE TIME.

MS. CHABER: COULD WE STRIKE THE COMMENTS OF COUNSEL, YOUR HONOR, ON THE SPEECHES?

THE COURT: THE COMMENTS OF COUNSEL ARE NOT EVIDENCE ANYWAY.

MR. BARRON: NO. I'M SORRY.

Q. WELL, SOME OF THE WORK YOU'VE DONE AS A WITNESS

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HAS BEEN FOR MS. CHABER AND HER LAW FILM; CORRECT?

A. CORRECT.

Q. ON NUMEROUS OCCASIONS?

A. NOT VERY MANY. A NUMBER OF OCCASIONS.

Q. HOW FREQUENTLY EACH YEAR?

A. THESE WORDS "OCCASIONAL" AND "NUMBERS" HAVE DIFFERENT MEANINGS. I THINK -- IN TERMS OF THE WARTNICK FIRM, AS IT IS NOW KNOWN, I DON'T KNOW. ONCE, TWICE, THREE TIMES A YEAR, SOMETHING LIKE THAT, BUT I'M NOT SURE.

I DON'T THINK, IN MY MIND'S EYE, IN TERMS OF SEPARATING THEM LIKE THAT.

Q. AND HAVE YOU BEEN PART OF THE GROUP OF PEOPLE WHO HAVE TESTIFIED IN HER CASES THAT INCLUDE, FOR EXAMPLE, DR. HORN AND DR. HAMMAR?

A. I DON'T UNDERSTAND THE QUESTION. I'M AWARE THAT THEY HAVE TESTIFIED IN OTHER CASES I'VE BEEN INVOLVED WITH, IF THAT ANSWERS YOUR QUESTION.

Q. OKAY. NOW, IN LIGHT OF THAT, AM I CORRECT THAT YOU HAVE SOME UNDERSTANDING OF WHAT THIS CASE GENERALLY IS ABOUT THAT MS. CHABER IS HERE TO OFFER YOU AS AN EXPERT IN?

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A. I'M SORRY. I DON'T UNDERSTAND THE PART AT THE BEGINNING, "IN THE LIGHT OF."
IN THE LIGHT OF WHAT?
Q. IN THE LIGHT OF YOUR EXPERIENCE OF TESTIFYING 100 TIMES, IN LIGHT OF THE FACT THAT YOU'VE TESTIFIED, WORKED WITH HER FIRM TWO TO THREE TIMES A YEAR, IN LIGHT OF THE FACT YOU HAVE BEEN INVOLVED IN CASES THAT HAVE INVOLVED DR. HORN AND DR. HAMMAR, ARE YOU COMFORTABLE THAT YOU HAVE

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AT LEAST A GENERAL UNDERSTANDING WHAT THIS CASE IS ABOUT?
A. WELL, I HAVE PREVIOUSLY BEEN AN EXPERT, SO I HAVE AN UNDERSTANDING.
I DON'T KNOW WHAT YOUR REFERENCE TO DR. HORN AND DR. HAMMAR MEANS. THAT'S NOT RELEVANT TO MY OPINIONS.
Q. WELL, I WANT TO GET BACK TO YOUR COMMENT ABOUT WHO IT WAS, WHETHER THE MAYO CLINIC OR SOMEBODY ELSE, WHO CAME UP WITH THIS IDEA ABOUT PEOPLE'S CONSTITUTION OR THEIR NERVOUS SYSTEM.
IN LIGHT OF THE FACT THAT YOU WERE GOING TO OFFER TESTIMONY ABOUT THAT, DID YOU THINK IT WAS AT ALL IMPORTANT TO TRY TO BRING SOME DOCUMENTS WITH YOU THAT WOULD SHOW THAT THIS DEFENDANT, PHILIP MORRIS, ACTUALLY SAID THAT AS THE PROPONENT FOR THE THEORY?
A. NO. I WASN'T REPRESENTING THAT PHILIP MORRIS DID IT. I JUST NOTED THAT AS BEING QUAINT THEORIES. AND I WAS AWARE OF THEM FROM THAT TIME, SOME OF THEM.
AND THE BULK OF THEM, AS I RECALL, WERE PROMOTED AND PUT FORTH BY SCIENTISTS WHO EITHER WORKED FOR OR WERE LINKED TO THE TOBACCO INSTITUTE AND TOBACCO COMPANIES. BUT I CAN'T VOUCH FOR IT INDIVIDUALLY.
I JUST WANT TO MAKE SURE THAT THE JURY UNDERSTANDS. AND I'M RECALLING FROM WHAT HAPPENED IN, I THINK, 1972.
Q. YOU HAVE NOW BEEN AS PRECISE AS YOU CAN BE ON THAT SUBJECT IN TERMS OF THAT FIRST RED HERRING?
A. I COULD GIVE MORE INFORMATION ABOUT WHAT MY LECTURE WAS ABOUT.

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Q. NO. AS TO WHO IS THE ONE THAT HAD THE RED HERRING THEORY THAT THEY PROPOSED, HAVE YOU BEEN AS PRECISE NOW IN GIVING YOUR ANSWER ABOUT THAT?
A. I THINK SO. I DON'T KNOW WHERE SPECIFICALLY THAT ONE CAME FROM.
Q. NOW, YOU ALSO MENTIONED A SECOND ONE ABOUT A RED HERRING.
DO YOU KNOW WHO SIR RICHARD DOLL IS?
A. YES, I DO.
Q. AS A MATTER OF FACT, WAS THAT A HYPOTHESIS THAT HE PUBLISHED?
A. NO, THAT WAS A REASON THAT TOBACCO DOESN'T CAUSE LUNG CANCER.
IN FACT, WHAT HE POINTED OUT, AS I RECALL, HE MAY HAVE BEEN THE PERSON WHO NOTED THAT THERE WAS A GOOD EXPLANATION FOR THAT, THAT IT MAY RELATE TO THE EXPENSE OF THE SMOKING OF A CIGARETTE.
Q. DOCTOR, AGAIN, CAN YOU IDENTIFY FOR ME PRECISELY WHO IT WAS THAT CAME UP WITH WHAT YOU CALLED A RED HERRING?
A. NO, I CAN'T, COUNSEL. BUT THE RED HERRING AGAIN WAS IT'S NOT TOBACCO CAUSING THE LUNG CANCER BECAUSE OF THAT PIECE OF EVIDENCE.
BUT I CAN'T SPECIFICALLY SAY WHAT NEWSPAPER

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CUTTING, WHAT SCIENTIFIC ARTICLE CUTTING OR WHO PUT IT FORTH, NO.

Q. DO YOU HAVE WITH YOU A DOCUMENT THAT WOULD DEMONSTRATE THAT THIS DEFENDANT, OR EVEN THE TOBACCO INSTITUTE, ITS TRADE ASSOCIATION THAT IT PARTICIPATED IN,

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WAS THE ONE THAT CREATED THAT RED HERRING?

A. I DO NOT.

Q. THE ARSENIC RED HERRING WAS THE THIRD ONE YOU MENTIONED.

WAS THAT PUBLISHED ACTUALLY IN THE 1964 SURGEON GENERAL'S REPORT?

A. THERE WAS MENTION OF ARSENIC CONTAMINANTS IN SURGEON GENERAL'S REPORTS. I DON'T REMEMBER WHICH ONE.

BUT NO STATEMENT IN ANY OF THE SURGEON GENERAL'S REPORTS THAT I RECALL SUGGESTED THAT ARSENIC WAS THE CAUSE OF LUNG CANCER TO SMOKERS AND NOT OTHER CONSTITUENTS OF THE SMOKE.

Q. WHO CREATED THAT RED HERRING AND WHEN, DOCTOR?

A. I DON'T KNOW.

Q. AGAIN, HAVE YOU MADE ANY EFFORT TO TRY TO DETERMINE WHETHER PHILIP MORRIS, THIS DEFENDANT, CREATED THAT RED HERRING?

A. NO, OF COURSE NOT. THAT'S NOT WHAT I'M HERE TO TESTIFY ABOUT.

Q. HAVE YOU TRIED TO DETERMINE WHETHER THE TOBACCO INSTITUTE OR ANY TRADE ASSOCIATION WITH WHICH THIS DEFENDANT WAS ASSOCIATED WAS THE ONE THAT CREATED WHAT YOU CALLED A RED HERRING?

A. NO.

Q. OKAY. BY THE WAY, CAN YOU GIVE US AN IDEA FOR HOW LONG A PERIOD YOUR TIME OR EFFORT HAS BEEN 10 TO 15 PERCENT AND YOUR INCOME HAS BEEN A THIRD FROM THIS KIND OF WORK THAT YOU'RE DOING, INCLUDING TESTIFYING IN COURT?

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A. WELL, ROUGHLY 10 YEARS. WHEN I FIRST CAME TO CALIFORNIA IN '83, I THINK ABOUT '84, I STARTED TESTIFYING.

IT INCREASED TO ROUGHLY THAT AMOUNT AFTER THREE, FOUR YEARS.

Q. HAVE YOU WRITTEN ON THE SUBJECT AT ALL, BEING AN EXPERT WITNESS?

A. NO.

Q. HAVE YOU TALKED ABOUT IT IN ANY TALKS OR SPEECHES?

A. YES.

Q. AND HAVE YOU DESCRIBED THE COURT SYSTEM AND WHAT IT'S LIKE TO BE A WITNESS?

A. YES. IN TEACHING EPIDEMIOLOGISTS, I TELL THEM THAT THEY MAY IN THEIR CAREER BE ASKED TO BE AN EXPERT. AND I DO AT TIMES REFER TO, VERY BRIEFLY, SOME OF THE ISSUES THAT ARE INVOLVED.

Q. NOW, ONE OF THE THINGS THAT A WITNESS CAN DO IS JUST GIVE TESTIMONY LIKE YOU ARE NOW, TALKING AND HAVING PEOPLE LISTEN TO IT; CORRECT? THAT'S ONE THING THAT A WITNESS CAN DO?

A. I THOUGHT THAT'S WHAT WE DID IN COURT.

Q. ALSO ON THE BOARD OR ON THE BUTCHER PAPER, YOU WROTE FOUR THINGS DOWN.

AND WAS IT YOUR HOPE OR INTENT TO HAVE THE JURORS WRITE DOWN THAT LITTLE FORMULA OF 1, 2, 3, 4? IS THAT WHY YOU WROTE IT?

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A. NO. I WROTE IT TO BE -- TO SAY SOMETHING THAT I THOUGHT THE EVIDENCE WAS VERY CLEAR ON. I WISHED TO PRESENT

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THAT.

AND IN ALL MY TEACHING, I FIND IT HELPS ME TO SLOW DOWN, SAY THINGS CLEARLY, AND WRITE THEM UP. AND OBVIOUSLY, IT GIVES AN OPPORTUNITY FOR PEOPLE TO TAKE NOTES, IF THEY WISH TO.

Q. BUT YOU SAID A LOT OF THINGS AND YOU'VE WRITTEN A FEW THINGS IN COMPARISON WITH WHAT YOU HAVE SAID.

DO YOU AGREE WITH ME ON THAT?

A. CERTAINLY.

Q. YOU WERE SELECTIVE IN WHAT YOU DECIDED TO WRITE ON THE BUTCHER PAPER; CORRECT?

A. YES, ABOUT AS FAR AS I WAS ALLOWED TO BE. I THINK --

Q. AND YOU REALIZED, I GUESS, THAT CAUSE WAS THE ISSUE UPON WHICH YOU WERE BEING CALLED TO TESTIFY ABOUT; RIGHT?

A. CORRECT.

Q. AND SO THIS WAS SORT OF A FORMULA THAT YOU WERE OFFERING FOR AN EVALUATION OF CAUSE; RIGHT?

A. NO. I WOULDN'T CALL IT -- YOU CALLED IT A FORMULA.

I'D SAY THE ESSENCE OF THE ARGUMENT TO ME ABOUT CAUSE IS VERY SIMPLE, AND I JUST PUT IT UP. I CERTAINLY WOULDN'T CALL IT A FORMULA.

Q. SO IT'S AN ARGUMENT. IN FACT, YOU CALLED IT SOMETHING THAT WASN'T TECHNICALLY DIFFICULT; CORRECT?

A. I THINK I SAID THAT.

Q. IN FACT, YOU SAID IT WAS UTTERLY CLEAR?

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A. PROBABLY. YES, IT IS UTTERLY CLEAR.

Q. NOW, BEFORE DECIDING ALL THIS, YOU HAD TO LOOK AT, FIRST OF ALL, DID YOU NOT, WHAT THE CLINICAL EVIDENCE WAS IN THIS CASE?

A. WELL, I DID LOOK TO SEE IF IT WAS ABOUT LUNG CANCER. I WAS AWARE THAT I WOULDN'T BE TESTIFYING AS TO WHETHER OR NOT IT WAS LUNG CANCER. I WOULDN'T BE PROVIDING PRIMARY EVIDENCE ON THAT AS A WITNESS.

BUT I HAVE THE UNDERSTANDING OF WHAT IT WAS ABOUT AND THERE WAS A DIAGNOSIS OF LUNG CANCER.

Q. NOW, YOU ARE NOT A CLINICIAN?

A. THAT IS CORRECT.

Q. BUT IN ORDER TO COME UP WITH THIS IDEA WHICH YOU WROTE ON THE BOARD FOR US AND YOUR BENEFIT, DID YOU TRY TO MARSHALL ALL THE EVIDENCE ON THAT FIRST QUESTION?

A. WHAT DO YOU MEAN "MARSHALL," COUNSEL? I DON'T UNDERSTAND.

IT'S BASED ON MY EXPERIENCE OVER MANY, MANY YEARS, BOTH AS A TEACHER, A RESEARCHER AND A STUDENT OF CANCER, ITS CAUSES, AND LUNG CANCER.

Q. YOU DON'T KNOW WHAT I MEAN BY THE WORD "MARSHALL"?

A. I DON'T KNOW WHAT YOU MEAN BY THE QUESTION, COUNSEL. IF YOU SAY "MARSHALL," I MEAN, I COULD SPEND THE NEXT YEAR PULLING TOGETHER OR TRYING TO ALL THE ARTICLES I'VE EVER READ THAT MIGHT RELATE TO LUNG CANCER AND SMOKING AND THE DIAGNOSIS OF LUNG CANCER. OBVIOUSLY, THAT'S VASTLY CLEAR.

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IT SEEMED TO ME SUCH A STRAIGHTFORWARD CASE, SIMPLY NOT SOMETHING THAT WAS NEEDED.
Q. DOCTOR, I'M ONLY NOW ASKING YOU ABOUT QUESTION NO. 1.
DO YOU WANT TO TURN AROUND AND LOOK AT THAT?
A. I'VE SEEN IT.
Q. OKAY. MY QUESTION IS, FIRST OF ALL, YOU UNDERSTOOD THAT THIS WAS --
A. CAN I -- I'M SORRY TO INTERRUPT. BUT IN TURNING AROUND, I WAS ANSWERING ABOUT THE WHOLE CONCEPT.
AS FAR AS THE FIRST LUNG CANCER PART GOES, I AM DRAWING, IT IS TRUE, ON MY EXPERIENCE IN EPIDEMIOLOGICAL STUDIES WHERE WE INCLUDE LUNG CANCER.
BUT NEVERTHELESS, I'M HERE WITH THE UNDERSTANDING THAT OTHERS WILL BE TESTIFYING PRIMARILY AS TO THE CLINICAL DIAGNOSIS AND NOT MYSELF.
I DIDN'T SEE MY EXERCISE TO MARSHALL EVIDENCE THAT THE PATIENT HAS LUNG CANCER.
Q. NOW, YOU SORT OF LOST ME.
AS AN EXPERT, THE LAW ENTITLES YOU TO OFFER AN OPINION.
YOU UNDERSTAND THAT THAT'S THE WAY IT WORKS? THAT IS WHAT YOU'VE DONE 100 TIMES BEFORE; CORRECT?
A. I DIDN'T HEAR THE FIRST PART OF THAT.
I OFFER OPINIONS. YES, I DO.
Q. OKAY.
A. BASED ON UNDERSTANDINGS.
Q. AND YOU'VE OFFERED FOUR OPINIONS THAT YOU WROTE

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ON THE BOARD.
AND THE FIRST ONE IS THAT "THE PATIENT HAS LUNG CANCER (MOST PROBABLY)," CORRECT?
A. NO. THAT IS -- THESE AREN'T A LIST OF OPINIONS, COUNSEL. THIS IS A LIST OF THE INFORMATION ON WHICH I BASED MY OPINION.
THE FIRST ONE IS MY UNDERSTANDING, BASED ON WHAT I HAD READ, THE CLINICAL REPORTS, BASED ON MY EXPERIENCE, THAT THE PATIENT HAS LUNG CANCER, OR PROBABLY DID, BUT BEING AWARE THAT OTHERS WOULD TESTIFY AS TO THE EVIDENCE FOR AND AGAINST THAT, CLINICALLY.
Q. WHEN YOU BASE AN OPINION ON AN UNDERSTANDING THAT, IN TURN, YOU TURN TO OTHER PIECES OF INFORMATION TO DEVELOP, YOU AGREE WITH ME THAT YOUR ULTIMATE OPINION IS ONLY AS GOOD AS YOUR UNDERSTANDING; CORRECT?
A. WELL, I WOULDN'T SAY "ONLY AS GOOD." BUT YOU ARE CORRECT, THAT IF I HAVE INDICATED PROBABLY -- IF IT'S IMPROBABLE THE PATIENT HAS LUNG CANCER, THEN OBVIOUSLY MY CONCLUSIONS DON'T FOLLOW.
Q. AND IN ORDER TO DETERMINE HOW GOOD YOUR UNDERSTANDING IS, YOU HAVE TO LOOK AT THE EVIDENCE, THE FACTS, THE INFORMATION AND TRY TO GATHER IT AND LOOK AT IT, DON'T YOU?
A. WELL, I DO LOOK AT IT, BUT I'M NOT TRYING TO BE THE DEFINITIVE PERSON MAKING THAT CONCLUSION, COUNSEL.
I DON'T DO PATHOLOGY. I LOOK AT THE PATHOLOGY REPORT, BUT NEVERTHELESS, THE PATHOLOGIST NEEDS TO TALK ABOUT THE PATHOLOGY REPORT.

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SO I DON'T QUITE UNDERSTAND YOUR QUESTION THERE.
Q. WELL, AS A MATTER OF FACT, WHEN YOU WROTE NO. 1,

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DID YOU HAVE IN MIND WHAT YOU HAD IN MIND IN YOUR DEPOSITION, THAT IN FACT THE PATHOLOGIST IN THIS CASE YOU THOUGHT WAS LOOKING AT TISSUE THAT HAD BEEN TAKEN FROM WITHIN THE LUNG?

A. COULD YOU REPEAT THE QUESTION, COUNSEL.

MR. BARRON: SURE. COULD SHE JUST READ IT BACK.

THE COURT: SURE.

(RECORD READ)

MR. BARRON: THANK YOU.

THE WITNESS: MY RECOLLECTION IS THAT THERE HAD BEEN AN IMMEDIATE --WHAT'S THE WORD -- A BIOPSY TAKEN, THAT IT WAS FROM THE HILAR MASS.

NOW, THAT I UNDERSTOOD, IN THE WAY I WOULD THINK OF IT, AND THAT THE HILUM ITSELF IS PART OF THE LUNG. WE DISCUSSED THAT AT LENGTH IN THE DEPOSITION.

I DO KNOW THAT THE INTERPRETATION WAS THAT THE ORIGIN OF THIS WAS THE LUNG.

BUT SPECIFICALLY, AS FAR AS THE ANATOMICAL LOCATION OF THE PRECISE BIOPSY, I DO REMEMBER THAT WE SPENT A LOT OF TIME IN THE DEPOSITION DISCUSSING THAT, AND I DON'T RECALL EXACTLY THE CONTENT OF THAT.

Q. TURN IN YOUR DEPOSITION, IF YOU WOULD, TO PAGE 31. AND I WON'T TAKE THE TIME TO READ IT ALL.

AND IF YOU CAN ANSWER THIS QUESTION YES OR NO, DOCTOR, I'D APPRECIATE IT. IF YOU NEED TO ADD TO IT AFTERWARDS, YOU MAY.

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IS THAT NOT YOUR DEPOSITION?

A. THAT IS VOLUME II.

YOU SAID PAGE 31?

THE COURT: YES. I DON'T HAVE VOLUME I.

MR. BARRON: I DON'T HAVE ONE BEFORE YOU. I'M SORRY, YOUR HONOR.

Q. HAVE YOU FOUND PAGE 31?

A. I HAVE.

Q. IF YOU LOOK QUICKLY, BECAUSE YOU CAN READ FASTER THAN WE CAN ACTUALLY SPEAK OUT LOUD, IF YOU LOOK AT LINE 11, YOUR ANSWER STARTS ALL THE WAY --

MS. CHABER: I WOULD --

MR. BARRON: MAY I JUST GET MY QUESTION OUT?

MS. CHABER: YES.

MR. BARRON: Q. -- DOWN TO PAGE 32, LINE 4. DO YOU AGREE THAT YOU INDICATED THERE THREE TIMES THAT THE MASS WAS IN THE LUNG?

A. (EXAMINING)

I'M CONFUSED, COUNSEL. I'M SORRY. YOU WERE REFERRING TO THE BIOPSY BEFORE. I DID SAY THERE WAS X-RAY EVIDENCE OF A MASS IN THE LUNG.

Q. OKAY.

A. RIGHT DOWN TO WHERE?

AND THERE IS EVIDENCE OF SOMETHING IN THE LUNG THAT LED TO IT BEING BIOPSIED.

Q. I'M TAKING YOU THROUGH THIS TO SAVE TIME.

THEN TURN TO PAGE 43, LINE 11 TO LINE 17. IF YOU'D LOOK AT THAT.

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A. (EXAMINING)

I SEE IT.

Q. OKAY. WAS IT YOUR IMPRESSION AT THE TIME THAT WHETHER THE TISSUE WAS TAKEN FROM THE HILAR AREA OR WITHIN THE LUNG, IT IN ESSENCE WAS LUNG TISSUE THAT WAS TAKEN AND

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BIOPSIED?
A. THE IMPRESSION WHEN I READ THE MATERIAL IS THAT THE PATHOLOGIST LOOKED AT THE BIOPSY AND DIAGNOSED THE LUNG CANCER. THAT'S WHAT MY IMPRESSION WAS IN LOOKING AND READING THE RECORDS THAT WERE SENT TO ME.
Q. WOULD YOU PULL THAT RECORD OUT FROM THE PATHOLOGIST, AND PLEASE INDICATE TO ME WHERE HE SAYS THAT HIS IMPRESSION IS THAT THIS IS LUNG CANCER.
COULD YOU TELL ME WHICH RECORD OF THE PATHOLOGIST? THERE'S ONLY ONE PATHOLOGY REPORT?
A. THAT'S NOT TRUE, COUNSEL. THERE'S ALSO A STATEMENT AND THERE'S A DEPOSITION.
Q. THERE IS NO DEPOSITION OF THE PATHOLOGIST IN THIS CASE.
A. I HAVE SOME OF THE MATERIAL. I NOTED THE REPORT BY DR. HAMMAR --
Q. WELL, LET ME STOP YOU RIGHT THERE AND INTERRUPT, IF I MIGHT.
YOU SEE DR. HAMMAR WASN'T INVOLVED IN THE CLINICAL TREATMENT OF THIS PATIENT, WAS HE?
A. I DON'T KNOW.
Q. OKAY. DR. HAMMAR, YOU KNOW FROM OTHER CASES WITH MS. CHABER, HOWEVER; CORRECT?

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A. I KNOW WHO HE IS, YES. I HAVE MET HIM.
Q. I WANT YOU TO ASSUME THAT HE WASN'T THE ONE WHO WROTE THE PATHOLOGY REPORT AT USC, DOWN IN LOS ANGELES.
WOULD YOU FIND THAT PATHOLOGY REPORT AND INDICATE WHERE IT'S REPORTED ON THE REPORT, IF IT IS AT ALL, THAT THE PATHOLOGIST WHO IS REPORTING IT IS REPORTING THAT HE'S FOUND LUNG CANCER.
A. I DON'T KNOW. I HAVEN'T -- WHAT I WAS REFERRING TO WAS THE PATHOLOGIST, DR. HAMMAR'S, REPORT, WHO INDICATED IT WAS A SMALL CELL LUNG CARCINOMA.
Q. OKAY. NOW THAT GETS TO -- IF I COULD, TO THE OTHER QUESTION, WHICH IS: WHEN YOU ARE GOING ABOUT TRYING TO DECIDE WHETHER YOU SHOULD WRITE SOMETHING LIKE NO. 1 ON THE BOARD IN A CASE LIKE THIS -- AND YOU CAN TURN AROUND AND LOOK AT IT, IF YOU LIKE -- DO YOU TRY TO, AS AN EXPERT, FAIRLY GO ABOUT TRYING TO LOOK AT WHAT THE REASONABLE AVAILABLE INFORMATION IS ON THIS SUBJECT BEFORE YOU WRITE NO. 1?
A. NO. WHEN I WROTE NO. 1, I WAS AWARE THAT OTHERS WOULD BE TESTIFYING IN THIS COURT. AND I'VE EXPLAINED THAT, COUNSEL.
SO WHAT I DO IS, I LOOK AT WHAT I'M SENT. IF THERE'S EVIDENCE OF LUNG CANCER AND I KNOW IF IT FITS WITH THE SEQUENCE THAT I'VE SEEN IN STUDIES THAT I'M INVOLVED WITH, I THEN SAY, "WELL, I SUSPECT THAT THERE WILL BE EVIDENCE COMING UP IN COURT TO DEMONSTRATE THAT IT IS.
SO IF IT'S DETERMINED BY THE JURY THAT THIS PATIENT HAS LUNG CANCER MOST PROBABLY, THEN THE REST

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FOLLOWS.
BUT I'M NOT HERE TO TESTIFY AS TO ALL THE EVIDENCE ABOUT NO. 1.
Q. SO YOU'RE, IN EFFECT, SORT OF GIVING THEM AN APPROACH, LIKE AN INSTRUCTION HOW TO APPROACH THE ISSUE OF CAUSATION, WITHOUT FILLING IN THE BLANKS?
A. COUNSEL, I THINK THAT IS NOT WHAT I'M DOING. I CERTAINLY AM NOT INSTRUCTING THE JURY.

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AS AN EPIDEMIOLOGIST WHO HAS STUDIED LUNG CANCER FOR MANY YEARS, I'M TELLING THEM THE BEST OF WHAT OF MY OPINIONS ARE AND HOW I WOULD LOOK AT IT. AND I'M TRYING TO MAKE IT SOMETHING THAT CAN BE UNDERSTOOD EASILY, BECAUSE IT IS VERY SIMPLE.

Q. BUT GETTING BACK TO THIS, IN ORDER EVEN TO WRITE THE NO. 1 UP THERE, WHEN YOU WROTE THESE, AND MOST PROBABLY BEFORE YOU DO THAT, DON'T YOU ORDINARILY WANT TO -- AS AN EXPERT, IF YOU'RE BEING THOROUGH AND FAIR -- TO TRY TO LOOK AT THE AVAILABLE EVIDENCE THAT THERE IS?

A. NO, COUNSEL. IF I SAW SOME EVIDENCE TO THE CONTRARY, I'D NOTE IT. BUT OBVIOUSLY, IF THERE'S EVIDENCE TO THE CONTRARY, THAT WILL COME OUT IN COURT.

I CAN'T DO EVERYTHING. I HAVE LIMITED TIME AND I FOCUS ON MY AREAS OF EXPERTISE. IT'S NOT MY JOB, AS I REGARD IT, TO DECIDE WHETHER OR NOT THAT IS TECHNICALLY VALID FROM A CLINICAL OR PATHOLOGICAL STEP.

ALL I'M SAYING IS THAT, IF INDEED THE PATIENT HAS LUNG CANCER MOST PROBABLY, AND IF THE PATIENT SMOKED FOR MANY YEARS, THEN THE OTHER TWO FOLLOW VERY SIMPLY.

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Q. YOU NEGLECTED TO WRITE THE WORD "IF" UP THERE IN NO. 1, THOUGH. YOU'RE NOW SPEAKING THE WORD "IF."

A. WELL, I'M TALKING THERE IN GENERAL. IF YOU ARE TALKING ABOUT PATIENTS, IF YOU DECIDE THE FIRST THING IS THE PATIENT HAS LUNG CANCER, NOW THERE IS NOT ENOUGH ROOM TO PUT EVERYTHING UP THERE.

THE SIMPLE POINT IS THE PATIENT HAS LUNG CANCER. THE PATIENT SMOKED FOR MANY YEARS. IF IT WERE A LUNG CANCER, THEN THE IF'S ARE DOWN THERE VERY CLEARLY.

Q. I WAS JUST GOING TO SAY YOU HAD ROOM ON 3 OR 4 TO PUT "IF," BUT YOU DIDN'T HAVE ROOM TO PUT A NUMBER UP THERE -- YOU HAD ROOM TO PUT THE WORD "IF" FOR 3 AND 4.

BUT ARE YOU SUGGESTING THAT THERE WASN'T ROOM UP THERE IN NO. 1 TO PUT "IF," IF THAT'S REALLY WHAT YOU WERE SAYING AT THE TIME?

A. IF I COULD PLAY WITH PUTTING MORE WORDS UP THERE, COUNSEL. I'M SAYING THAT IN PUTTING WORDS UP, YOU CAN LOOK AT THEM, WORK AROUND WITH THEM. THEY ARE NOT PERFECT.

BUT I WASN'T TRYING TO --I JUST PUT IT UP FROM MEMORY. I WAS NOT LOOKING AT NOTES. I THINK IT'S UNDERSTANDABLE.

IF YOU ARE CONCERNED THAT THEY ARE THERE, THEN THAT'S YOUR -- SO BE IT.

Q. DOCTOR, AT THE TIME OF YOUR DEPOSITION, ACTUALLY, DO YOU REMEMBER THAT YOU WERE AT TIMES ANNOYED WITH ME BECAUSE YOU SAID IT WAS QUITE SIMPLE THAT THE EVIDENCE SHOWED THAT MS. HENLEY HAD LUNG CANCER?

A. NO. I THINK THAT WHAT WAS QUITE SIMPLE WAS THE

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EVIDENCE, AND THE WAY I LOOKED AT IT, AND WHAT I HAD DONE WAS VERY SIMPLE.

AND INDEED, I WAS ANNOYED AT YOU BECAUSE THIS INFORMATION WENT ON AND ON AND ON, AS IF I WAS A PATHOLOGIST, AS IF I WAS THE CLINICIAN, AND AS IF I WAS DOING ALL THE DIAGNOSIS.

Q. NOW, YOU MENTIONED YOU DIDN'T HAVE TIME, BUT YOU WERE GIVEN SOME MATERIAL BY MS. CHABER TO REVIEW; CORRECT?

A. I WAS GIVEN MATERIAL, THAT IS CORRECT. I HAD PLENTY OF TIME, IN MY OPINION, TO COME UP WITH A GOOD ASSESSMENT OF THIS CASE FOR PURPOSES OF COURT TESTIMONY.

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Q. AS TO NO. 1, DID YOU ASK FOR ANY MORE MATERIAL?
A. NO.
Q. IN CASES LIKE THIS, GENERALLY, ARE YOU AWARE THAT BESIDES PEOPLE LIKE DR. HAMMAR, WHO HAVE BEEN RETAINED BY MS. CHABER, THERE MIGHT BE SOME OTHER PEOPLE WHO ALSO LOOKED AT THE CASE AND, FOR EXAMPLE, LOOKED AT IT AT THE REQUEST OF DEFENDANTS?
A. WELL, WHEN YOU SAY "CASES LIKE THIS," COUNSEL, I HAVE NOT SEEN OR BEEN INVOLVED WITH A LUNG CANCER CASE LIKE THIS THAT HAS BEEN CONTESTED.
Q. JUST GENERAL CASES.
A. YOU SAID "CASES LIKE THIS," COUNSEL, AND THIS IS MY FIRST TIME THAT I HAVE TESTIFIED IN --
THE COURT: DON'T ARGUE WITH HIM. HE CHANGED THE QUESTION.
MR. BARRON: I DIDN'T MEAN SPECIFICALLY A LUNG CANCER. LET ME JUST START OVER.

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Q. IN CASES WHERE YOU ARE BEING RETAINED BY MS. CHABER, AS YOU HAVE IN THE PAST, YOU ARE ALWAYS AWARE, AREN'T YOU, THAT THERE IS A DEFENDANT, AND THAT DEFENDANT OFTEN WANTS TO GET A SECOND OPINION OR RETAIN SOMEBODY TO LOOK AT IT TO SEE WHETHER IT MAKES SENSE FROM THEIR POINT OF VIEW; CORRECT?
A. CORRECT.
Q. AND SOMETIMES, THERE ARE DEPOSITIONS --
A. CORRECT.
Q. -- OF THOSE PEOPLE ON THE DEFENSE SIDE WHO HAVE LOOKED AT IT?
A. CORRECT.
Q. DID YOU ASK FOR ANY OF THOSE DEPOSITIONS TO TRY TO FIGURE OUT WHETHER NO. 1 SHOULD BE WRITTEN AS IT WAS WRITTEN?
A. WELL, FIRSTLY, I DID NOT ASK FOR THOSE DEPOSITIONS, BUT NO. 1 SHOULD BE WRITTEN AS IT IS WRITTEN.
IN ANY CASE, I THINK IT'S VERY CLEAR WHAT I DID AND WHY I DID IT.
Q. DO YOU KNOW WHO DR. WYNDER IS, W-Y-N-D-E-R?
A. I KNOW OF A DR. WYNDER WHO HAS PUBLISHED STUDIES THAT RELATE TO DIET AND CANCER.
Q. RELATING TO WHAT?
A. DIET AND CANCER IN PARTICULAR. HE HAS ALSO DONE SOME SMOKING STUDIES.
Q. DO YOU KNOW AN ERNEST WYNDER?
A. NOT PERSONALLY, BUT I KNOW I'VE READ ARTICLES.
Q. DO YOU CONSIDER THOSE ARTICLES RELIABLE

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AUTHORITIES?
A. I NEED TO LOOK AT THEM ONE BY ONE.
Q. YOU'RE NOT FAMILIAR ENOUGH WITH DR. WYNDER AND HIS REPUTATION IN THE FIELD TO THINK THAT WHAT HE HAS PUBLISHED IS RELIABLE UNLESS YOU LOOK AT THEM ONE BY ONE?
A. THAT IS CORRECT. I NEVER SAID THAT OF ANY AUTHOR. I'D WANT TO LOOK AT EACH ARTICLE OVER THE YEARS OF ALL OF US. OVER THE YEARS, ALL OF US AT TIMES WRITE ARTICLES THAT WE MAY LATER CHANGE OUR VIEWS ON.
Q. YOU MADE A STATEMENT THAT: "THE RELATIONSHIP BETWEEN SMOKING AND LUNG CANCER IS VERY STRONG. IN FACT, IT HAS BEEN CONSISTENTLY SHOWN FROM COUNTRY TO COUNTRY WORLDWIDE."
DO YOU REMEMBER SAYING THAT --

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A. YES.
Q. -- THIS MORNING?
A. PROBABLY. I HAVE SAID THAT STATEMENT BEFORE. I'M NOT CERTAIN IF IT'S TODAY.
Q. IT WAS TODAY, BECAUSE AT THE LUNCH BREAK, I ASKED OUR COURT REPORTER TO GET IT VERBATIM, SO I WOULDN'T MAKE A MISTAKE.
ARE YOU AWARE OF AN ARTICLE BY ERNEST WYNDER ENTITLED "COMPARATIVE EPIDEMIOLOGY OF CANCER BETWEEN THE UNITED STATES AND JAPAN"?
A. NO, I DON'T RECALL THAT ARTICLE.
MR. BARRON: MAY I SHOW IT TO YOU. I'LL HAVE THIS MARKED.
THE CLERK: DEFENDANT'S EXHIBIT 2800.

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(DOCUMENT MORE PARTICULARLY DESCRIBED IN THE INDEX MARKED FOR IDENTIFICATION DEFENDANT'S EXHIBIT # 2800)

MR. BARRON: THIS ONE IS FOR HIS HONOR.
Q. ARE YOU FAMILIAR WITH THAT?
A. I HAVE NOT READ IT BEFORE.
Q. OKAY. THE RULE IS, I CAN'T ASK YOU ABOUT IT THEN, SO CAN I TAKE IT BACK.
ARE YOU AWARE OF STATISTICS SHOWING THE PERCENTAGE OF MEN IN JAPAN WHO SMOKE AS OPPOSED TO THE PERCENTAGE OF MEN IN THE UNITED STATES WHO SMOKE?
A. NOT OFF THE TOP OF MY HEAD.
NOW, I'M AWARE OF JAPANESE STUDIES OF LUNG CANCER THAT HAVE BEEN LINKED TO SMOKING, BUT I DON'T RECALL THE NUMERIC PROPORTIONS OF SMOKERS FOUND IN THOSE STUDIES.
Q. YOU DON'T KNOW WHETHER THE JAPANESE MEN SMOKE TO A MUCH GREATER PERCENTAGE THAN AMERICAN MEN?
A. YOU MEAN THE PROPORTION WHO SMOKE?
NO, I DON'T OFFHAND. AT TIMES, THE PROPORTION HAS BEEN VERY HIGH IN THE U.S. OF COURSE, IT HAS BEEN DROPPING MARKEDLY.
AND IN JAPAN, AT ONE POINT IT WAS VERY LOW. IT DID INCREASE MARKEDLY. WHAT THE COMPARISONS ARE NOW OR EARLIER, I DON'T HAVE THOSE NUMBERS IN MY HEAD.
Q. ARE YOU AWARE THAT AS LONG AS -- LET ME ASK YOU, EVEN MORE THAN 30 YEARS AGO, IN 1955, ARE YOU AWARE WHETHER THE JAPANESE MEN SMOKED AT A MUCH HIGHER PERCENTAGE THAN THE

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UNITED STATES MEN?
A. I'M NOT AWARE OF THAT, NO.
Q. ARE YOU AWARE OF WHETHER THERE'S ANY DISPARITY -- DO YOU WANT TO STOP?
A. I DID WANT TO SAY AT CERTAIN POINTS IN TIME, AROUND ABOUT 85 TO 90 PERCENT OF MEN IN INDUSTRIAL SETTINGS IN THE U.S., FOR EXAMPLE, HAD SMOKED, AND YOU CAN'T GET MUCH HIGHER THAN THAT.
AT CERTAIN POINTS IN TIME, JAPANESE SMOKING RATES ARE LOWER. THEY COULD WELL, AS I INDICATED, HAVE BEEN HIGHER AT OTHER PERIODS.
Q. DO YOU HAVE AN IDEA WHAT THE ADJUSTED LUNG CANCER RATE, CANCER MORTALITY RATE IS FOR JAPANESE MEN IN THE DECADE OF 1985 WHEN COMPARED WITH U.S. MEN?
A. I DON'T HAVE THOSE NUMBERS, NO.
Q. JUST A COUPLE MORE QUESTIONS -- WELL, MORE THAN A COUPLE, BUT I'M GETTING CLOSE.

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DO YOU AGREE THAT EPIDEMIOLOGY IS THE STUDY OF POPULATION GROUPS?
A. IT INCLUDES THAT. THAT'S NOT ITS DEFINITION.
Q. DO YOU AGREE THAT, GENERALLY, WHAT YOU'RE TRYING TO DO IS TO COMPARE HOW FREQUENTLY DISEASE OCCURS IN ONE GROUP COMPARED WITH ANOTHER GROUP?
A. THAT'S ONE PART OF WHAT WE DO.
Q. DO YOU AGREE THAT IT DOES EMPLOY STATISTICAL METHODS?
A. WE USE STATISTICAL METHODS, YES.
Q. AND DO YOU AGREE THAT IT MEASURES THE STRENGTH OF

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THE ASSOCIATION BETWEEN AN AGENT AND DISEASE AMONG OTHER THINGS, SO-CALLED RELATIVE RISK?
A. IT IS.
Q. DO YOU AGREE THAT STATISTICAL METHODS CANNOT ESTABLISH PROOF OF A CAUSAL RELATIONSHIP?
A. NOT ON THEIR OWN.
Q. AND SO IN THAT REGARD, YOU AGREE WITH THE SURGEON GENERAL; CORRECT?
A. I DON'T KNOW. I DON'T RECALL ALL THE MANY STATEMENTS MADE BY THE SURGEON GENERAL.
Q. DO YOU AGREE THAT CAUSATION THEN BECOMES A MATTER OF JUDGMENT?
A. IT INCLUDES JUDGMENT, OF COURSE.
Q. AND THE JUDGMENT IS TO JUDGE THE SIGNIFICANCE OF THE ASSOCIATION THROUGH VARIOUS CRITERIA; CORRECT?
A. NO, THAT'S NOT THE WORD. I'D GO AND COMPLETE THE LIST OF CRITERIA AND EXPLAIN EACH ONE OF THEM. IT'S NOT TRITE LIKE THAT, COUNSEL.
Q. NOW, I KNOW THAT YOU WOULD GO INTO THE DEPTH OF IT, BUT THAT IS WHAT YOU DID?
A. I WOULDN'T CHARACTERIZE IT THAT WAY.
Q. NOW, ARE YOU SUGGESTING THAT IT'S PROPER FOR YOU TO ESTABLISH OR PROVE A CAUSE OF DISEASE IN A PARTICULAR INDIVIDUAL BY REFERENCING WHAT THE EPIDEMIOLOGICAL STUDIES SHOW?
A. ABSOLUTELY. THE EPIDEMIOLOGICAL STUDIES PROVIDE THE HUMAN EVIDENCE, UNDERPINNINGS FOR INFERRING CAUSE IN HUMANS.

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NOW, OBVIOUSLY, YOU ALSO NEED EVIDENCE OF EXPOSURE, YOU NEED A DIAGNOSIS AND OTHER PARTS.
BUT NEVERTHELESS, HUMAN EVIDENCE COMES FROM GROUPS OF PATIENTS, NOT JUST ONE PATIENT, AND GROUPS OF PEOPLE. AND SO IT'S ESSENTIALLY EPIDEMIOLOGIC IN NATURE.
Q. YOU AGREE THAT, IN FACT, WHAT YOU SUGGEST IS THE PROCESS IS NOT FOR WHICH THE PROCESS WAS DESIGNED?
A. I DON'T UNDERSTAND THE QUESTION.
Q. DO YOU AGREE THAT THESE STATISTICAL METHODS AND THE OTHER FEATURES OF EPIDEMIOLOGY WERE NOT DESIGNED TO PROVE OR ESTABLISH CAUSE IN A PARTICULAR INDIVIDUAL?
A. I DON'T UNDERSTAND THE QUESTION. I'VE INDICATED EPIDEMIOLOGY IS ABOUT DETERMINING CAUSE IN GROUPS OF PEOPLE.
IF YOU THEN WISH TO MAKE INFERENCES ABOUT INDIVIDUALS, YOU HAVE TO USE THAT INFORMATION.
NOW, THE PRIMARY DESIGN OF WHAT WE DO IS ALWAYS WE LOOK AT GROUPS TO REACH AN INFERENCE ABOUT INDIVIDUALS.
SO IT IS TRUE THAT OUR PRIMARY FOCUS IN THIS EXERCISE IS STUDYING GROUPS.

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AND SINCE WE'RE IN THIS AREA, A LOT OF OUR WORK FOCUSING ON MAJOR PUBLIC HEALTH DECISIONS IS INVOLVING A LOT OF PEOPLE, AND THEN A LOT OF THE USE OF IT IS ALSO FOR GROUPS.

BUT IT IS AT THE SAME TIME DESIGNED TO MAKE A CORRECT INTERPRETATION THAT RELATES TO THE INDIVIDUALS IN THE GROUPS TOO.

Q. HAVE YOU READ THE SURGEON GENERAL'S REPORT

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DEALING WITH THAT VERY ISSUE I JUST ASKED YOU ABOUT?

I'D LIKE TO SHOW YOU PAGE --

MS. CHABER: WHAT YEAR?

MR. BARRON: 1964.

THE WITNESS: ONCE UPON A TIME, I THINK I READ MOST OF THAT REPORT.

MR. BARRON: Q. DOCTOR, IF YOU HAD WANTED TO SECURE SOME MORE INFORMATION FROM MS. CHABER BEFORE COMING TO COURT AND WRITING 1, 2, 3, 4, WOULD YOU HAVE FELT THAT YOU WOULD HAVE BEEN ABLE TO ASK FOR THAT INFORMATION?

A. I DON'T QUITE UNDERSTAND. I DIDN'T NEED TO ASK FOR ANYTHING MORE IN ORDER TO STATE WHAT I'VE STATED TODAY AND REACHED THE OPINIONS I HAVE REACHED IN THIS TRIAL.

MR. BARRON: I HAVE NO FURTHER QUESTIONS AT THIS TIME. THANKS.

THE COURT: ANYTHING FURTHER?

MS. CHABER: NO.

THE COURT: OKAY. MAY DR. SMITH BE EXCUSED?

MS. CHABER: YES.

THE COURT: MR. BARRON, MAY DR. SMITH BE EXCUSED?

MR. BARRON: YES. CERTAINLY, YOUR HONOR.

THE COURT: DR. SMITH, YOU ARE EXCUSED.

(WITNESS EXCUSED)

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